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**Naval Sea Systems Command  
Occupational Safety and Health  
Record Keeping System**

**Environmental Exposure Module  
Program Maintenance Manual**

June 1987

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## PREFACE

Since August 1984, The MITRE Corporation has been supporting the Naval Sea Systems Command (NAVSEA) and the Naval Medical Command (NAVMEDCOM) in their joint efforts to enhance the Navy Occupational Health Information Management System (NOHIMS). NOHIMS, whose initial version was developed at the Naval Health Research Center (NHRC), is a composite of two subsystems: an industrial subsystem and a medical subsystem. The goal of the enhancement effort was to create a comprehensive occupational health and safety system for Navy industrial facilities by expanding upon the original NOHIMS functions and adding modules for hazard deficiency abatement, hazardous material control, injury claims and compensation, and safety and health training. To meet this goal, MITRE developed an enhanced industrial subsystem, referred to as the Occupational Safety and Health Record Keeping System (OSHRKS), using a prototyping approach and a public domain data base management software package, the Veterans Administration's (VA's) FileManager (FileMan).

OSHRKS consists of the following seven modules:

- Environmental Exposure
- Medical Exam Scheduling
- Hazardous Materials Control
- Hazard Deficiency Abatement
- Injury and Compensation Claims
- Safety and Health Training
- Administration

Each NAVSEA facility will use from four to seven of these modules depending on its information needs. The NAVMEDCOM sites require three of the industrial modules and the Administration module in addition to the medical subsystem.

Complete and accurate technical and non-technical documentation was required for each of these modules. This documentation was to describe clearly and accurately the capabilities of OSHRKS--an advanced, online, integrated system based on the use of a data base management system and a programmer tool kit--while also satisfying the Navy's documentation standards. Representatives from various groups within the Navy, working

with members of MITRE's technical staff, created a set of documentation guidelines for the OSHRKS modules. These guidelines specified the title of each document and its content and format.

The following three types of documents have been prepared for each of the first six modules listed above:

- Users' Manual - This manual describes, in non-technical terms, the module's major input and output processes. Examples of reports and displays produced by the module are included. This document is intended for use by the reader who is interested in understanding the module's capabilities.
- Operators' Guide - This guide explains how a user interacts with the module to enter or retrieve data. For each menu option in a module, an overview of the purpose of the option is presented, an example prompt sequence is displayed, and detailed explanations of the user's interactions to specific prompts are discussed. These documents are intended for use by those people who will be entering data into or retrieving data from the module.
- Program Maintenance Manual - This manual describes the software used by the module and is intended for use by the programmer who must maintain or enhance the module's software.

Three additional documents that provide documentation on the Administration module and on system-wide activity have also been prepared. The Primer describes, in general, how a user interacts with a FileMan-based system and enters and retrieves data from the Administration module. The System Manager's Guide provides instructions to the staff that must keep the system operational on a day-to-day basis. Largely, it serves as the Operators' Guide for the Administration module. System management functions needed to keep the other modules operational are also explained in this document. The System-Wide Program Maintenance Manual describes the software used in the Administration module and those software utilities that are used by all modules. This document is intended for use by the maintenance programmer.

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## 1.0 GENERAL

### 1.1 Purpose of the Program Maintenance Manual

→ This document describes the software used by the Environmental Exposure (EE) module in the Naval Sea Systems Command's (NAVSEA's) Occupational Safety and Health Record Keeping System (OSHRKS). An overview of the entire module is presented, followed by detailed descriptions of the routines that support each function in the module. The information in this document is intended to help the computer support staff to maintain the EE module software. For a management-level view of the EE module, the user is referred to the Environmental Exposure Module Users' Manual. A detailed discussion of how the user interacts with the module is found in the Environmental Exposure Module Operators' Guide.

Keywords: *Management Information Systems, Occupational diseases, Health surveys, Military medicine,*

### 1.2 References

The following references provide technical information relevant to the EE module: *Industrial medicine. (SDW)* ←

- VA FileMan User's Manual, Version 17, Veterans Administration, March 1986
- VA FileMan Programmer's Manual, Version 17, Veterans Administration, March 1986
- OSHRKS System-Wide Program Maintenance Manual
- OSHRKS Primer
- The Environmental Exposure Module Users' Manual
- The Environmental Exposure Module Operators' Guide
- System Manager's Guide

The following references provide background information on the EE module:

- Functional Specifications for the NOHIMS Environmental and Personal Exposure module, The MITRE Corporation, Virginia Beach Conference, May 1985
- Navy Occupational Safety and Health (NAVOSH) Program Manual, OPNAV Instruction 5100.23B, 31 August 1983

### 1.3 Terms and Abbreviations

The following terms and abbreviations are used in this manual:

- ACGIH: American College of Governmental Industrial Hygienists.
- Boundary: An area isolated from surrounding areas in which a process is being conducted that produces high concentrations of a stressor.
- Bulk Sampling: The collection of specimens of suspect materials to be analyzed in order to determine the presence of a stressor.
- Capture Velocity: That velocity, at a distance from a hood, necessary to overcome dispersive forces and capture the contaminant.
- Ceiling Limit: A concentration which cannot be exceeded for any length of time.
- Code 106: The Occupational Safety and Health Office at the shipyard (NAVSEA only).
- dB(A): A sound level reading in decibels as measured on the A-weighted network of a sound level meter.
- Decibel-dB: A unit used to express sound pressure levels; specifically, 20 times the logarithm of the ratio of the measured sound pressure to a reference quantity, 20 micropascals (0.0002 microbars). In hearing testing, the unit used to express hearing threshold levels as referred to audiometric zero (re: ANSI S3.6, 1969 [NOTAL]).
- Document Number: The number used by the Supply Department to identify uniquely their records in the Materials Management System.
- EE Module: Environmental Exposure module of OSHRKS.
- Engineering Controls: Isolation, enclosure, exhaust ventilation, and dust collection used to meet exposure limits.
- FileMan: The data base management package written by the Veterans Administration to interact with the MUMPS (see below) programming language. This package, also called File Manager, is used in OSHRKS to handle data manipulation needs.
- HMC: Hazardous Materials Control module of OSHRKS.

- HMIS: Hazardous Materials Information System.
- IH: Industrial Hygienist, Industrial Hygiene.
- Inspection: A comprehensive survey of all or part of a workplace to detect safety and health hazards as distinguished from routine, day-to-day evaluation and monitoring by local Occupational Safety and Health (OSH) personnel.
- Kernel: A package of programming utilities written by the Veterans Administration for use with the MUMPS (see below) programming language. This package is used in OSHRKS for menu management, task management, security control, electronic mail, and related activities.
- LAYGO: Learn As You Go--the ability to add terms to a vocabulary while entering data into a related file.
- MES: Medical Examination Scheduling module of OSHRKS.
- MSAL (Medical Surveillance Action Level): Medical examination qualification is required for any employee expected to enter into areas where airborne concentration may regularly exceed the specified airborne action level. The MSAL includes both a specified stressor concentration (generally about one-half of the Permissible Exposure Limit (PEL)) and a number of days or duration of exposure at or above the specified stressor concentration.
- MUMPS (Massachusetts General Hospital Utility Multi-Programming System): A programming language used to develop OSHRKS.
- NAVSEA: Naval Sea Systems Command.
- NIOSH: National Institute of Occupational Safety and Health.
- Occupation: A defined set of jobs, each with its own code, that is used to classify the primary function of each employee.
- Operation: A defined set of procedures, each with its own code, that is used to classify specific tasks performed by employees in the course of their work.
- OPNAVINST: A Navy policy directive publication.
- OSH: Occupational Safety and Health.
- OSHA: Occupational Safety and Health Administration.

- OSHRKS: Occupational Safety and Health Record Keeping System.
- PEL (Permissible Exposure Limit): PELs are published by OSHA. They are based on interrelationships between data from experimental animal and human studies and from data on industrial experience obtained through clinical and epidemiological studies of workers to prevent irritation, discomfort, or occupational illnesses. PELs are stressor concentration values in air below which nearly all persons may be exposed for given durations without adverse effects. There are two types of PELs:
  1. Permissible Exposure Limit—Time Weighted Average (PEL-TWA). The concentrations in air of a stressor averaged over an eight hour or ten hour workday as appropriate. There may be contact with time period concentrations above the PEL concentration as long as they are balanced by time period concentrations below the PEL concentration so that the concentration average over the appropriate workday does not exceed the PEL-TWA.
  2. Permissible Exposure Limit—Ceiling (PEL-C). A PEL-C is a concentration which may not be exceeded, even instantaneously. The irritant gases or compounds with a ceiling are denoted by a "C".
- PPE (Personal Protective Equipment): A device or item to be worn, used or put in place for the safety or protection of an individual or the public at large, when performing work assignments in or entering hazardous areas, or under hazardous conditions. PPE includes hearing protection, respirators, electrical matting, barricades, traffic cones, lights, safety lines, life jackets, protective clothing, shoes, gloves, etc.
- Primer: OSHRKS Primer, see References.
- STEL: Short Term Exposure Limit (a 15-minute time weighted average exposure measurement).
- Stressor: See Toxic Substance.
- TC Number: An approval number assigned by NIOSH and the Mine Safety Health Administration in testing and certifying the respirator.
- Template: A file entry containing a description of an input sequence or an output report.
- Tickler: A dated "scratch pad" file for noting reminders and/or messages.

- TLV (Threshold Limit Values): Established by the American Conference of Governmental Industrial Hygienists (ACGIH), TLVs refer to airborne concentrations of a substance and represent conditions under which it is believed that nearly all workers may be exposed day after day without adverse effect.
- Toxic Substance: Any chemical substance, biological agent (bacteria, virus, fungus, etc.), or physical stress, noise, heat, cold, hypo-hyperbaric pressure, etc., which is:
  1. Regulated by any NAVOSH Standard or Federal Law or rule due to a hazard to health.
  2. Listed in the latest printed edition of the National Institute for Occupational Safety and Health (NIOSH) Registry of Toxic Effects of Chemicals.
- TWA (Time-Weighted Average): An exposure measurement calculated to represent an eight-hour exposure.
- U.I.C. (Unit Identification Code): A unique number assigned to each Navy facility.
- VA: Veterans Administration.
- VDI: Video Display Terminal.
- Walkthrough: See Inspection.

#### 1.4 Programming Language(s) and Conventions

The EE module software is written in the Massachusetts General Hospital Utility Multi-Programming System (MUMPS) programming language. MUMPS is a standard language (X11.1-1984) approved by the American National Standards Institute (ANSI), though non-standard dialects exist. Non-standard language features have been avoided as much as possible so that OSHRKS can run in any standard MUMPS environment.

Certain features of OSHRKS, such as error trapping, require the use of implementation-specific language features. When necessary, these features are implemented via M/VX, the InterSystems Corporation's MUMPS language product for the VAX computer. For each option in this manual using non-standard features, an explicit discussion of the feature is included in the Remarks subsection.

The OSHRKS software is based on the use of two MUMPS-based software packages: the VA FileMan data base management system and the VA Kernel system management packages. Knowledge of FileMan is essential to the

maintenance programmer. Extensive use is made of FileMan input templates, sort templates, and print templates. Many OSHRKS options use direct calls to FileMan utility routines, e.g., DIC, DIP, DIQ, DIE, DIWF, within the MUMPS code to perform such activities as lookup, print, inquiry, input, and form letter print, respectively. Additionally, through the use of templates and data dictionaries, certain security features of FileMan are activated in OSHRKS. Furthermore, ad hoc query in OSHRKS is done through the use of the FileMan Search (Option 3) and Print (Option 2) options. Also, the FileMan data dictionary\* is used to define all of the files in this module. The reader must have carefully reviewed the FileMan Users' Manual and the FileMan Programmers' Manual, published by the Veterans Administration (VA), before using this manual or some of the terminology, specific to FileMan, used in this manual will be unclear.

The Kernel package is used in OSHRKS to provide security (user and device levels), menu management, and task management. Where custom MUMPS code has been used, the Kernel sets FileMan variables and invokes a FileMan routine to perform the appropriate function. For a complete technical view of OSHRKS, this manual must be used in conjunction with the documentation provided by the VA on the FileMan and Kernel packages (see Section 1.2).

### 1.5 Organization of the Manual

Section 2.0 provides a non-technical overview of the module and an overview of the module's files. Section 3.0 presents the module's menus; for each menu option, the number of the section where the option is discussed is shown. Sections 4.0 through 15.0 describe the software used by the various menu options. Each section covers the options associated with a specific process; a process is a collection of options that perform related functions. Section 16.0 describes routines that are called from FileMan computed fields.

Each option's description in Sections 4.0 through 16.0 contains the following subsections:

- Purpose - Describes in non-technical terms the function(s) which the option performs.
- Overview - Describes the type of option and the templates, files, subfiles, and routines it uses. If the option is a routine option, i.e., it invokes the use of custom MUMPS code, the flow among routines and each routine's major function(s) are described.

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\*If the maintenance programmer using this manual needs to review a file's data dictionary, he or she should use the FileMan List File Attributes option to generate the most current file data dictionary.

- Globals Referenced - Lists by name and file number each file and subfile read or updated, the global referenced, and the module that has ownership of the global.
- Variables - Lists each variable name with a definition of its use.
- Remarks - Describes any special processing, coding conventions, algorithms, interface consequences, triggers, computed fields, and input syntax checks that are specific to the option. If a module-specific utility routine or software feature is involved, the reader is referred to the appropriate section of the manual.

#### 1.6 Routine Structure Diagram Conventions

Most of the options in the EE module are routine options, meaning that the Kernel invokes a custom-coded set of routines to perform the functions embodied in the routine. For each of these options, a routine structure diagram is included to describe the set of routines that are used. Each routine in the structure diagram is shown as a rectangle. The structure diagram indicates the control flow within the routine by both the positioning of the rectangles and the orientation of the connecting lines. When two rectangles are connected by vertical lines without arrows, the upper program is "calling" the lower program through the use of the MUMPS "Do" command. The "called" routine returns control back to the "calling" program when the "called" routine completes its work. When two rectangles are connected by a line with arrows, this means that one routine is passing control to the other by means of a MUMPS "GO TO" command; usually these routines appear horizontally in the diagram. The direction of the arrow indicates the direction in which control is transferred. When a module-wide utility routine is invoked as part of an option, the routine is marked with a single asterisk (\*) on the routine structure diagram. The reader must refer to a later section of this manual for a complete description of the utility routine (and its internal flow). When a system-wide utility routine is used, e.g., T2GED (the standard input driver program that performs completeness and consistency checking), the routine structure diagram shows this routine with a double asterisk ("\*\*"). The reader must refer to the OSHRKS System-Wide Program Maintenance Manual for more detailed discussion of this routine and its internal flow.



## 2.0 MODULE DESIGN OVERVIEW

### 2.1 Module Design Summary

The EE module is composed of eleven major processes, each dealing with several different kinds of data. From an overview perspective, however, the module addresses four major areas of functionality:

- Maintaining survey data
- Maintaining data on boundary operations
- Maintaining data on collecting instruments
- Assisting Industrial Hygiene (IH) managers in planning the monitoring activities of their staff

The remaining capabilities either support these major processes (as in the case of tables maintenance) or are relatively simple functions that deal with an independent set of data (as in the case of lab tracking). Since this section presents an overview of the module, it only discusses the major processes. Figure 2-1 presents an overview of the module which corresponds to the discussion in this section.

The first major function of the EE module is to maintain records of the survey data collected in the field. In Figure 2-1 these processes are represented in the box called "Maintain Survey Data". The module maintains files which contain survey data from walkthrough inspections, sampling (air, direct reading, bulk, and wipe samples), noise surveys, heatstress surveys, and ventilation surveys. Additionally, a survey action file is maintained that contains notes from the industrial hygienist (IH) monitors, concerning follow-up actions they plan to take. The maintenance of survey data also includes the following capabilities:

- Survey data identifying materials in use in work environments is automatically expanded in the data base to provide a corresponding list of stressors present in the environment.
- Sample results are evaluated automatically against the established exposure limits (when these exist) to provide the IH staff with a list of overexposures and over medical surveillance action level (MSAL) samples. Through an interface with the Medical Exam Scheduling (MES) module, appropriate actions are automatically taken for employees who have been exposed at or above limits to be scheduled.

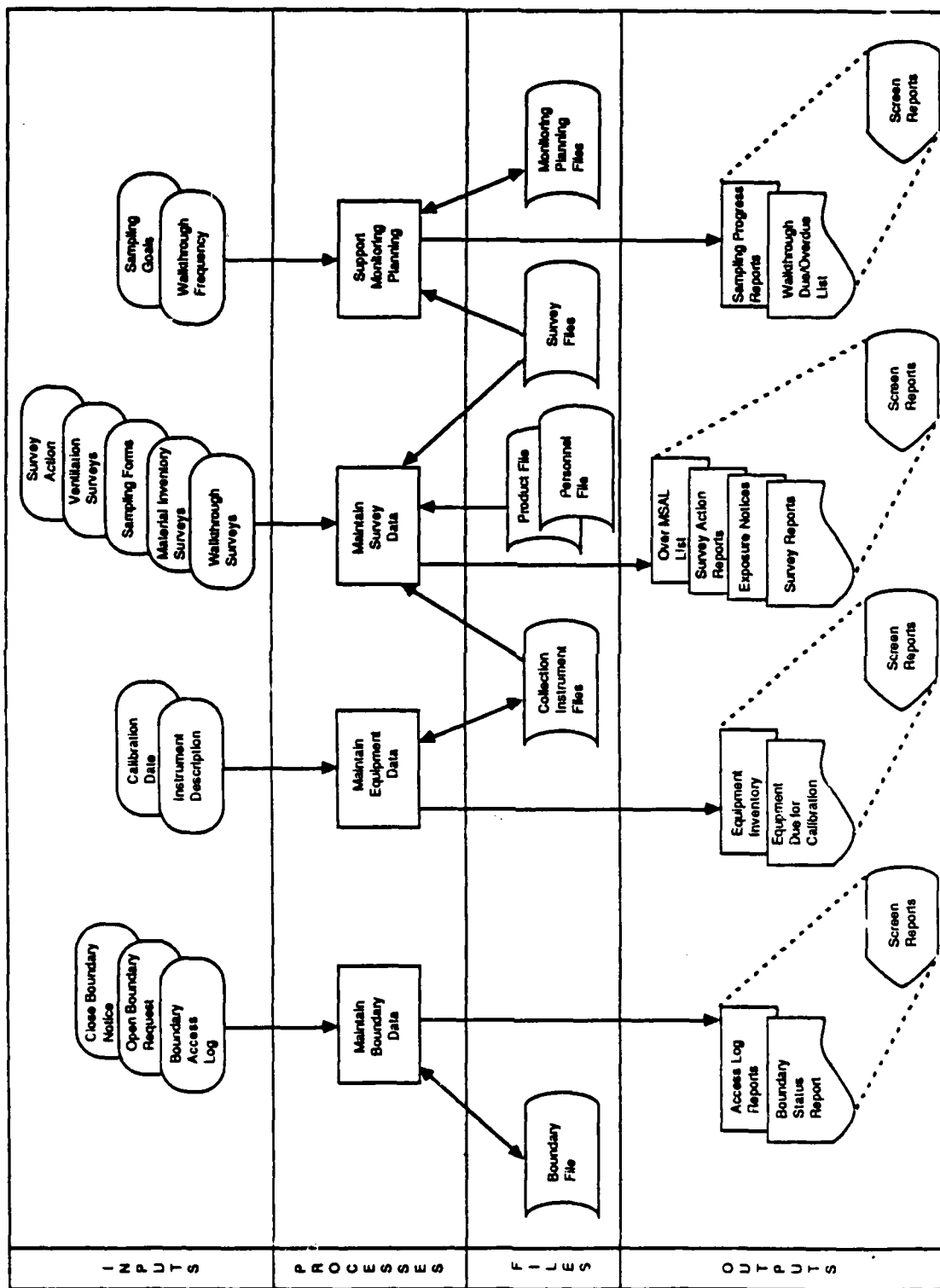


FIGURE 2-1  
OSHRKS ENVIRONMENTAL EXPOSURE MODULE OVERVIEW

- Via a form letter interface, exposure notices are produced which automatically incorporate exposure data into the text of the notice.
- Reports are produced to show survey actions which are due or overdue.
- Reports of the survey data are provided in three formats: detailed survey data for each type of survey, exposure data on employees, and summary reports.

The second major function of the EE module is to maintain the required records on the operations performed in boundaries. A boundary operation requires that a record of identifying information about the operation, the dates established and disestablished, as well as details of personnel access to the boundary area be maintained. Reports are available within the boundary data functions to provide information on boundary status and access. In Figure 2-1, these processes are represented in the box labelled "Maintain Boundary Data".

The third major function of the EE module is to maintain an inventory of the collection instruments and to record the dates on which they are calibrated. Not all sites will elect to record the calibration data in the system. When a site chooses to use the calibration data capability, the equipment data processes provide a reminder report when an instrument is due for calibration. These processes are represented in Figure 2-1 by the "Maintain Equipment Data" box. The Collection Instrument file is used to control the vocabulary of collection instruments used in the sampling of workplaces.

The fourth major function of the EE module is to assist the IH managers in planning the monitoring activities of their staff. In Figure 2-1 these processes are represented by the box labelled "Support Monitoring Planning". Monitoring support consists of the following two capabilities:

- Samples collected are automatically counted by the module and compared against user-established annual and overall goals for the number of samples desired.
- Based on a user-defined frequency for reinspection, (or 12 months in keeping with Navy policy), reports are produced that indicate the work environments in which walkthroughs are due or overdue.

## 2.2 File Overview

The EE module uses 35 files, as indicated in Table 2-1. The first 12 files in this table are application files containing data specific to

TABLE 2-1  
FILES AND GLOBALS USED  
BY THE ENVIRONMENTAL EXPOSURE MODULE

FILE NAME	FILE NUMBER	GLOBAL REFERENCE	MODULE
Boundary	1071	↑EBOUND(	EE
Walkthrough	1085	↑ESURV(	EE
Sample Survey	1124	↑ESAMP(	EE
Ventilation Survey	1140	↑EVENT(	EE
Collection Instrument	1086	↑EXP(1086,	EE
Lab Tracking	1130	↑EXP(1130,	EE
Monitoring Plan	1114	↑EXP(1114,	EE
Over MSAL Results	1137	↑EXP(1137,	EE
Sampling Goals	1117	↑EXP(1117,	EE
Survey Action	1107	↑EXP(1107,	EE
Samp Progress	1121	↑EXP(1121,	EE
Survey Number	1146	↑EXP(0,	EE
Product	1142	↑EMAT(	EE
Survey Monitor	1104	↑EXP(1104,	EE
Personal Protective Equipment	1103	↑EXP(1103,	EE
Respirators	1105	↑EXP(1105,	EE
Exposure Notices	1082	↑EXP(1082,	EE
Collection Instrument Type	1094	↑EXP(1094,	EE
Calibration Agency	1095	↑EXP(1095,	EE
Equipment Storage Location	1096	↑EXP(1096,	EE
Frequency of Ops	1106	↑EXP(1106,	EE
Sampling Strategy	1112	↑EXP(1112,	EE
Laboratories (Outside)	1131	↑EXP(1131,	EE
Vent System	1147	↑EXP(1147,	EE
Vent Source	1148	↑EXP(1148,	EE
Counters	1141	↑EXP(1141,	EE
Ingredients	1077	↑HMC(1077,	HMC
Materials	1080	↑HMC(	HMC
Site	1041	↑AGENCY(1041	ADMIN
Location	1073	↑AGENCY(1073,	ADMIN
Agency Unit	1074	↑AGENCY(0,	ADMIN
Employee	1004	↑EMPLOY(	ADMIN
Operation	1087	↑DIZ(1087,	ADMIN
Stressor	1083	↑STRESS(0,	ADMIN
Sample Units	1101	↑EXP(1101,	ADMIN

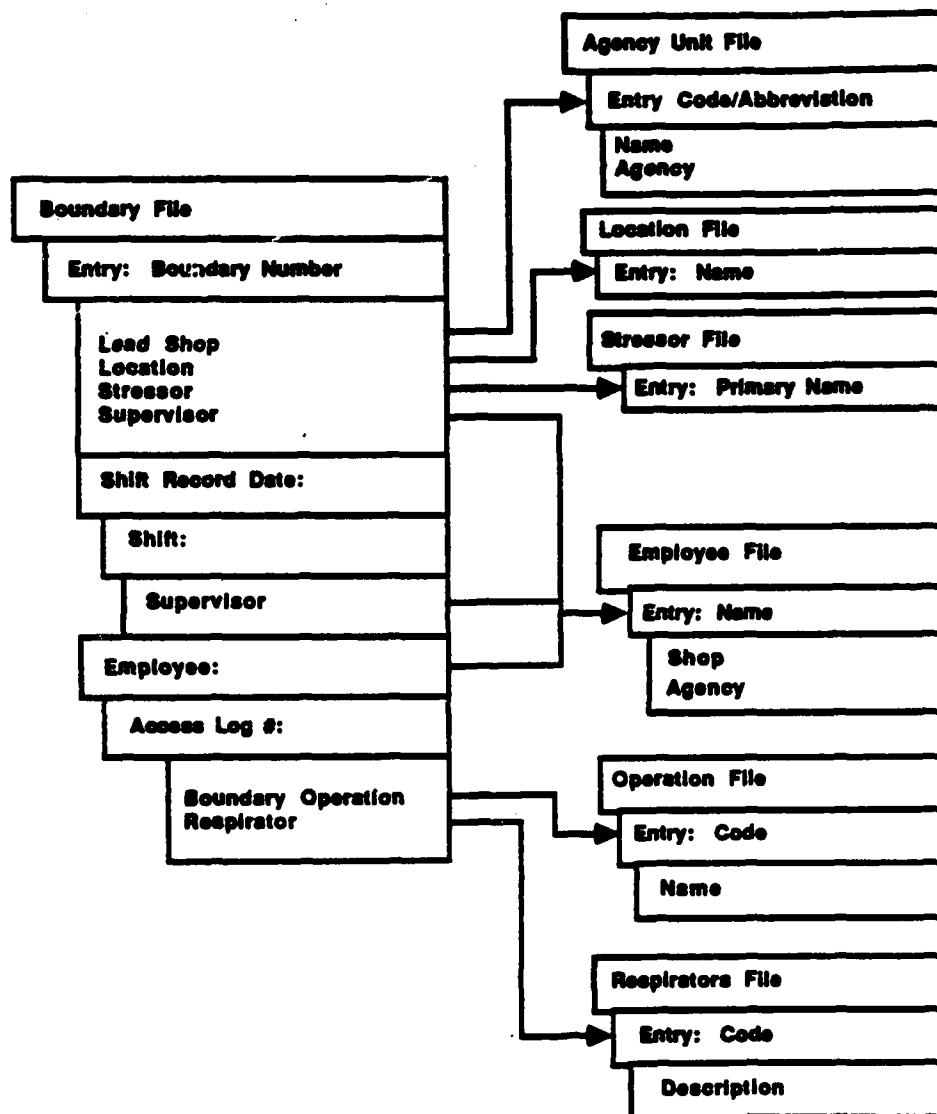
the EE module's objectives. The next 14 files are reference files specific to the EE module. The last 9 files listed in the table are files owned by other modules that the EE module uses. (A module "owns" a file if it contains the options which create and maintain the contents of the file.)

The Boundary file contains data about each boundary's status and about its establishment and disestablishment dates. For those boundaries in which access is controlled by access logs, data about each shift in which the boundary was in operation is maintained as well as each employee's access log data. The Boundary Number field is the ID field of the file. Figure 2-2 illustrates the Boundary file's relationship to the other files of the system.

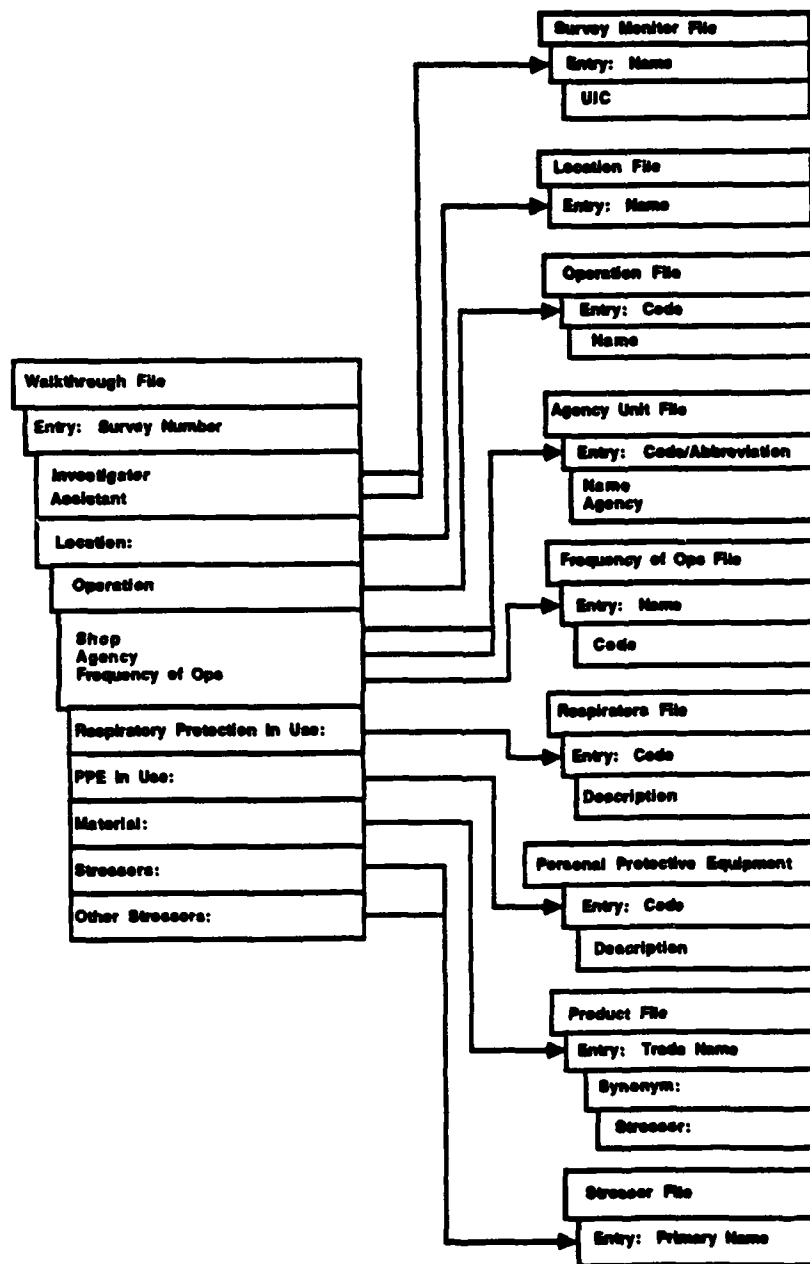
The Walkthrough file contains data from each walkthrough survey. Figure 2-3 illustrates the Walkthrough file's relationship to the other files of the system. The Survey Number is the ID field of the file. In the Walkthrough file, a survey entry contains data from multiple locations. Multiple operations are contained in each location. The data for each location/operation describes the machinery, engineering controls in use, other controls in use, personal protective equipment in use, respirators in use, materials, and stressors which are not directly related to the materials. The complete stressor list in the Stressors subfile is generated automatically by the system. The Product file is used to find the stressor contents of each material, and the non-material-related stressors are also maintained in the Stressors subfile.

The Sample Survey file contains data from sampling events. Air samples, direct reading samples, noise surveys, heatstress surveys, and bulk and wipe samples are all contained in the file. The ID field of the file is the Survey Number. Figure 2-4 illustrates the Sample Survey file's relationship to the other files of the system. Each sample survey contains one or more Industrial Hygiene Cover Sheets which are contained in the Document Number subfile. Within this subfile are one or more sampling forms (or noise or heatstress survey forms) in the Page Number subfile. Bulk and wipe samples are kept separately in the Bulk/Wipe Page Number subfile.

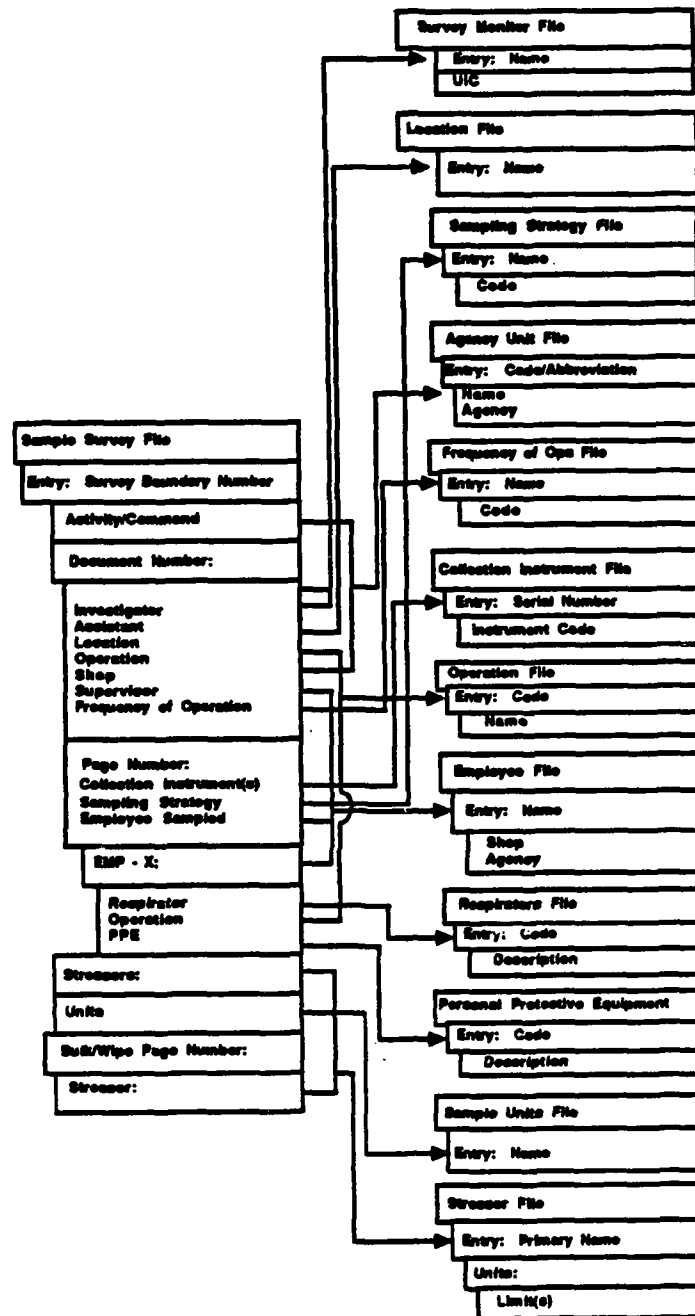
The Ventilation Survey file contains the data from ventilation surveys. Figure 2-5 illustrates the relationship between the Ventilation Survey file and the other files of the system. Each separate Ventilation Survey Form is contained in a file entry. The ID field of the file is the Document Number. On lookup, file entries are screened on the Survey Number field. The entry contains such data as the date, time, and shop where the survey was conducted, and information to identify the system and the source being described. The site at which this module is installed may choose to record just a satisfactory/unsatisfactory status for the system and source, or may record measurements. Measurements of the duct,



**FIGURE 2-2  
BOUNDARY FILE RELATIONSHIPS**

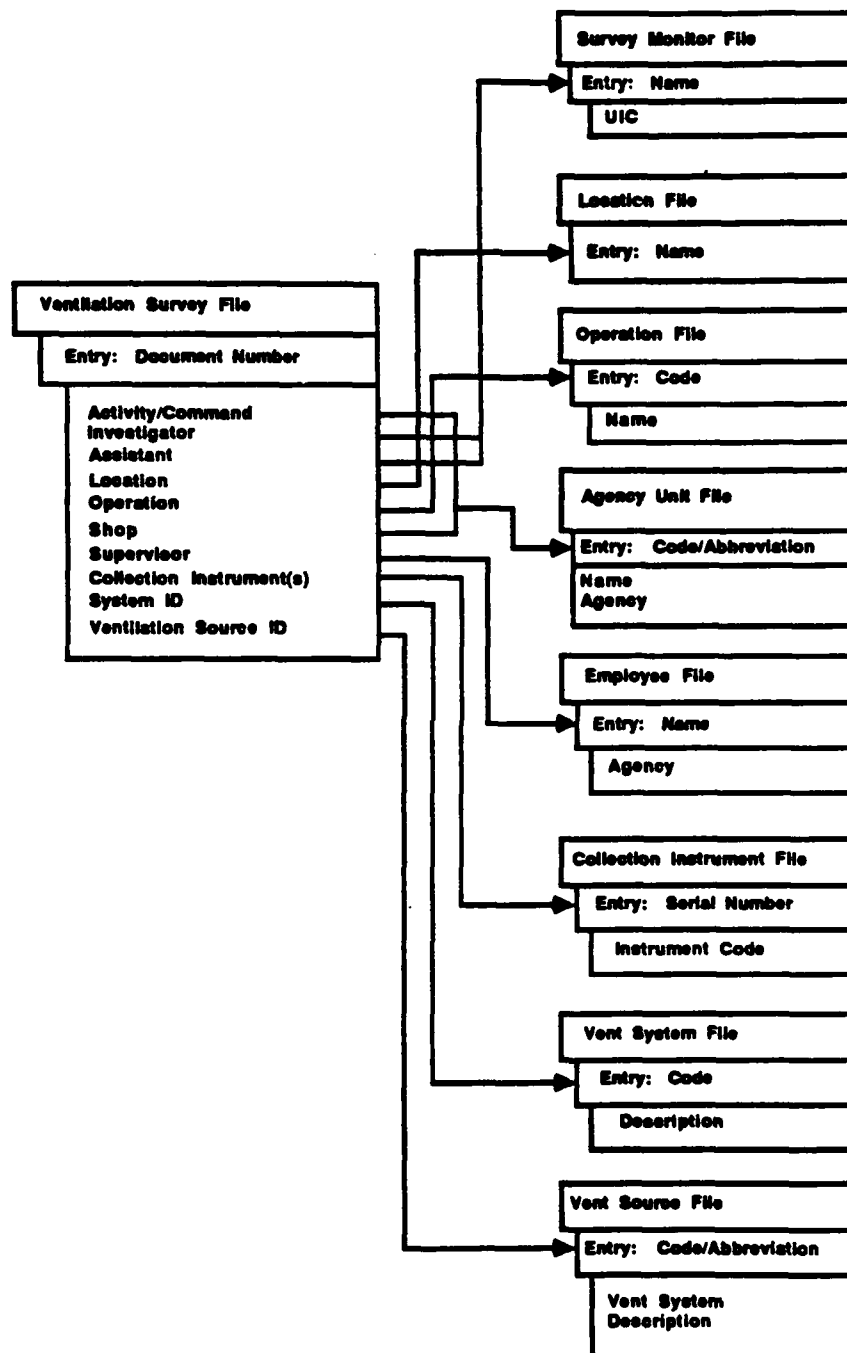


**FIGURE 2-3  
WALKTHROUGH FILE RELATIONSHIPS**



**FIGURE 2-4  
SAMPLE SURVEY FILE RELATIONSHIPS**





**FIGURE 2-5  
VENTILATION SURVEY FILE RELATIONSHIPS**

face, slot, and capture velocities and the static pressure are contained in the Measurement Type subfile. For each measurement type, several measurements may be recorded in the Measurement Number subfile.

The Collection Instrument file contains a record of each collection instrument in use for sampling. Figure 2-6 illustrates this file's relationship to the other files in the system. In the file, each instrument entry contains an instrument code or nickname to make it easier to identify the instrument when entering samples or survey results. The ID field of the file is the Serial Number of the instrument. In addition to the inventory of the available collection instruments, the file contains a subfile of calibration dates and costs for each instrument. The person responsible for routine calibration of instruments can use the date of next calibration in this file to keep up with the required workload.

The Lab Tracking file contains data about each sample that is sent out of the facility for analysis. Since this file is not related to any other file in the system via pointers, it is not depicted in a figure. The date the sample is expected to be returned is stored, providing the capability to produce the reports of outstanding and overdue samples.

The Monitoring Plan file contains the data that describes the most recent walkthrough survey for each location/operation. It also contains a field called "Survey Every n Months" which is the frequency for repeating the walkthrough survey. To ensure accurate and up-to-date data, the most recent survey data is put into this file by a "compile" routine prior to printing the Walkthroughs Due and/or Walkthroughs Overdue Lists. Figure 2-7 illustrates this file's relationship to the other files in the system.

The Over MSAL Results file contains an entry for each stressor result which met or exceeded an exposure limit, as recorded in the Stressor file at the time the sample data was entered. If the sample was a personal sample, one entry exists for each employee named as "sampled" or "in the area" at the time of sampling. Each entry in the file is assigned a unique number to identify it. This number is used as the ID field of the entry. The file is created by a "compile" routine that can be invoked directly from the menu. Entries in this file from the most recent complete or partial compile are deleted if the Compile Over MSAL option is rerun. Figure 2-8 illustrates this file's relationship to the other files in the system.

The Sampling Goals file contains the goals for the number of samples to be collected for a particular stressor in a specified location and operation. The ID field is Location. Within each location entry is an Operation subfile, within the Operation subfile is a Stressors subfile. Figure 2-9 illustrates this file's relationship to the other files in the system. Annual as well as overall goals are maintained.

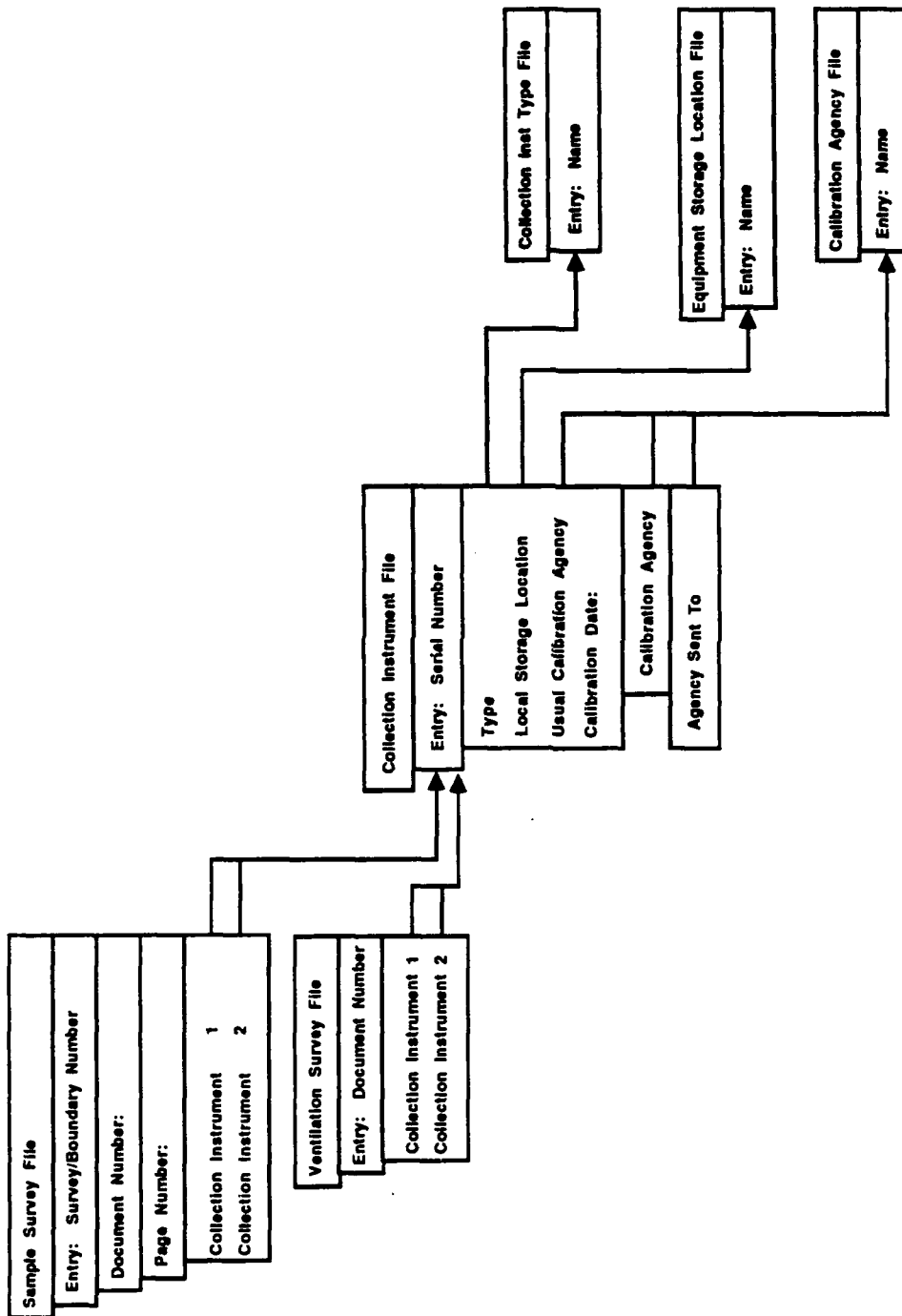
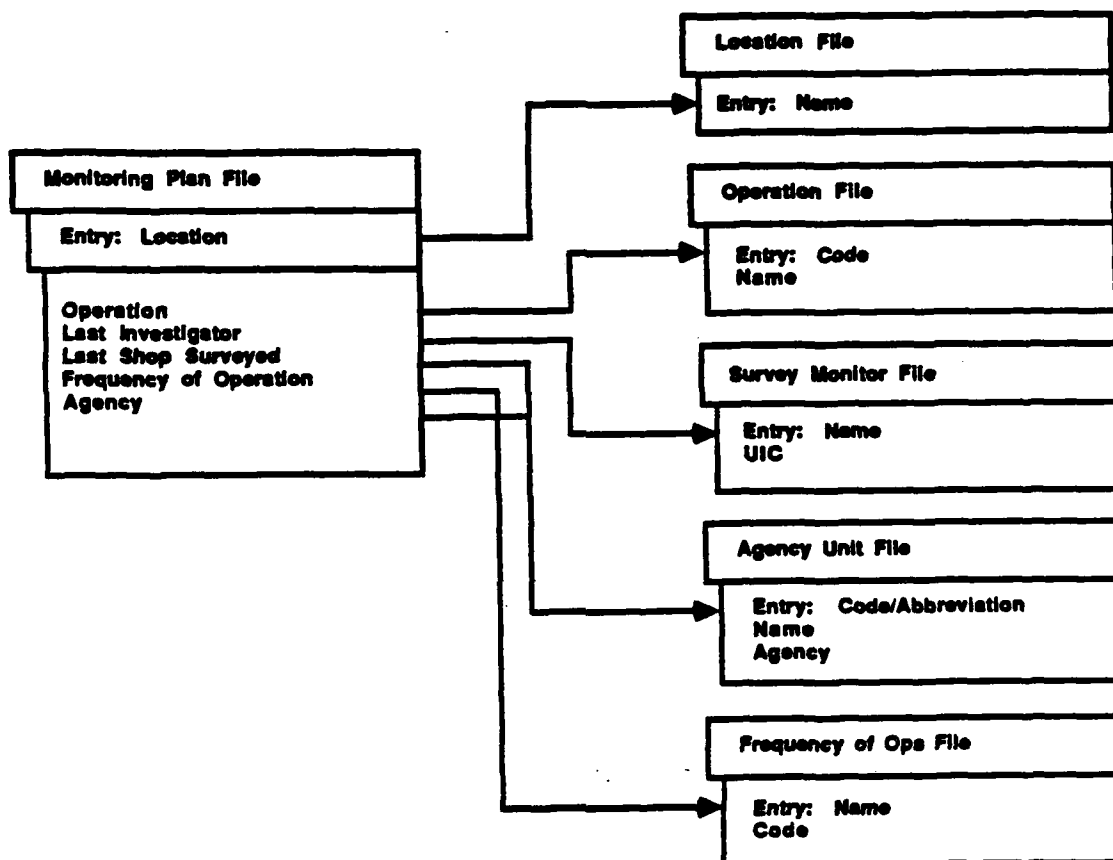
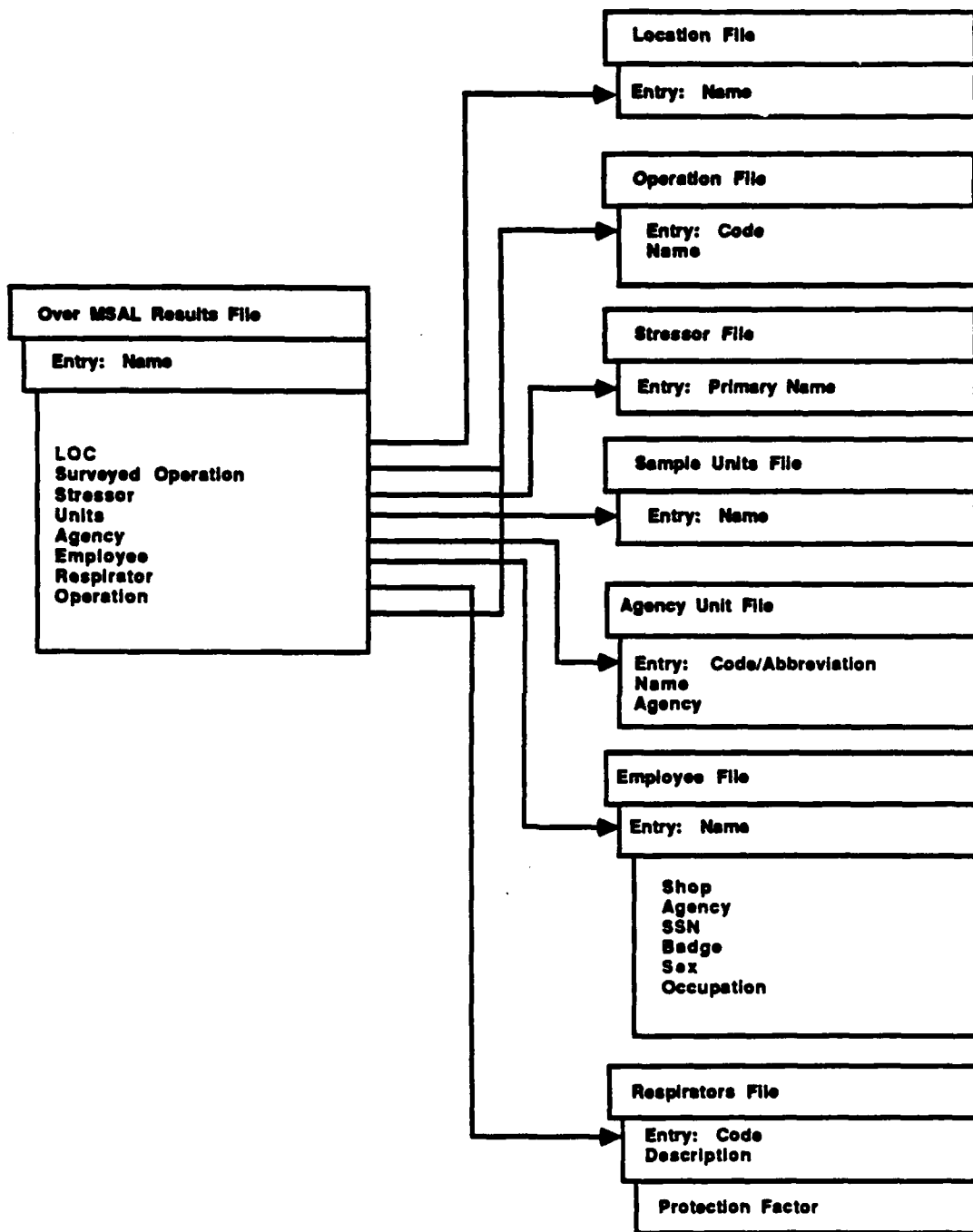


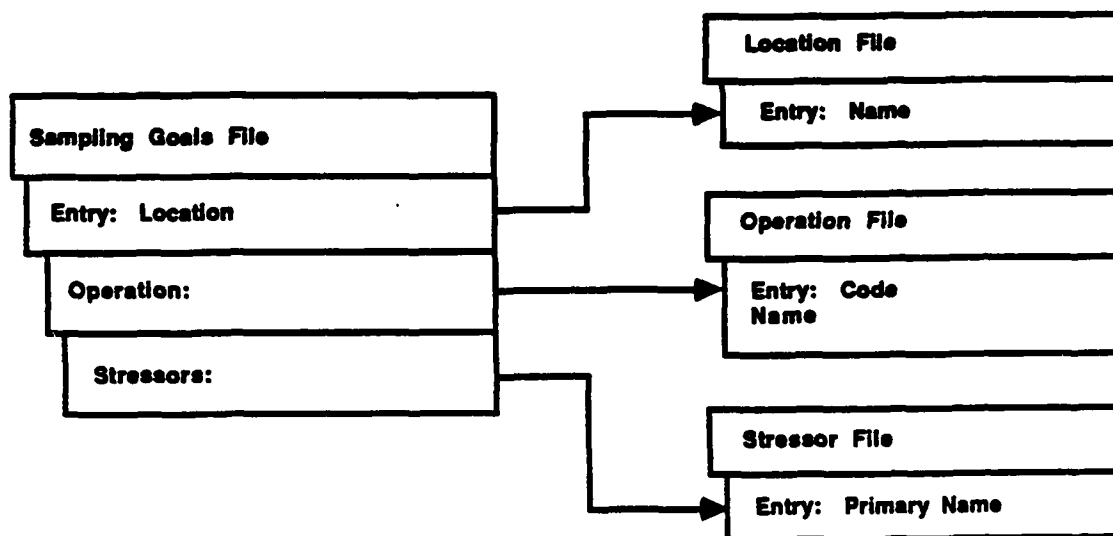
FIGURE 2-6  
COLLECTION INSTRUMENT FILE RELATIONSHIPS



**FIGURE 2-7**  
**MONITORING PLAN FILE RELATIONSHIPS**



**FIGURE 2-8  
OVER MSAL RESULTS FILE RELATIONSHIPS**



**FIGURE 2-9**  
**SAMPLING GOALS FILE RELATIONSHIPS**

The Survey Action file functions as a file of reminder notes, i.e., a tickler file, for the staff. Figure 2-10 illustrates this file's relationship to the other files in the system. The ID field of this file is a unique number generated by the system at the time the survey action is entered. Each entry contains a description of the survey for which an investigator created a note related to a condition found during a survey. The investigator who wishes to follow up is also identified.

The Samp Progress file contains the number of time weighted average (TWA) samples collected on each date, for each stressor found in each location and operation. The file is used in conjunction with the Sampling Goals file to produce the Sampling Progress Report. Figure 2-11 illustrates this file's relationship to the other files in the system.

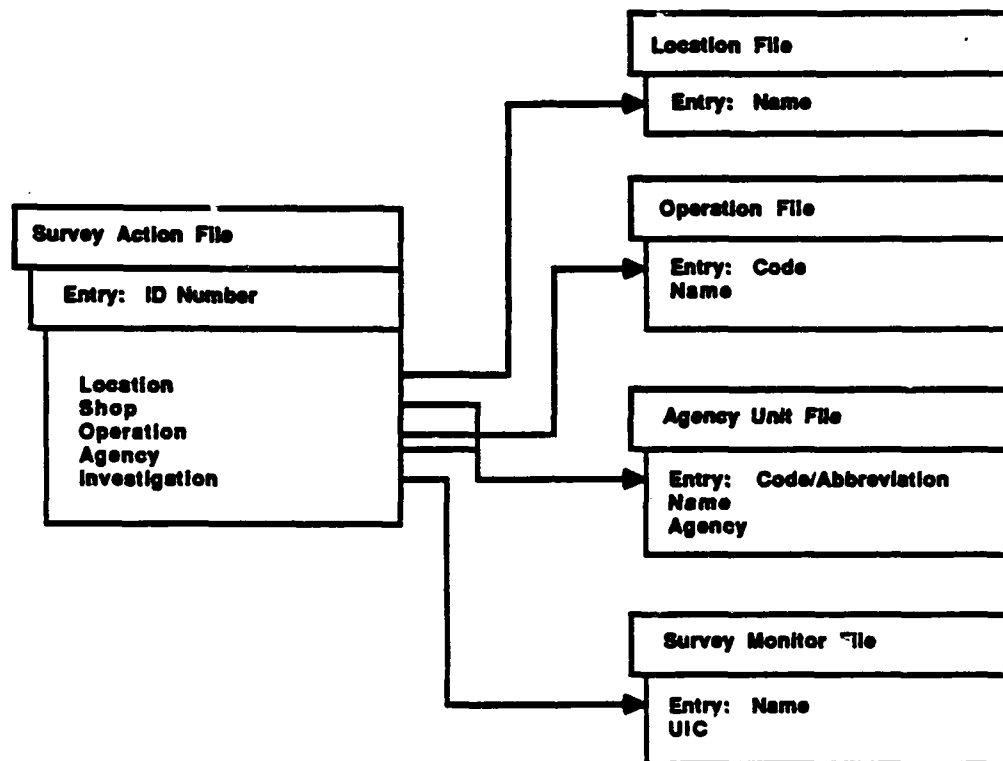
The Survey Number file contains data just for ventilation surveys. Its ID field is the unique number generated by the system at the time the survey is entered. This file is not related to any other file in the system.

### 2.3 Naming Conventions

The globals used as application files and reference files for EE begin with the letter "E". The files that are expected to be large and very actively updated have been given unique names. Application files that are not updated as often and reference files are all maintained in the ↑EXP global.

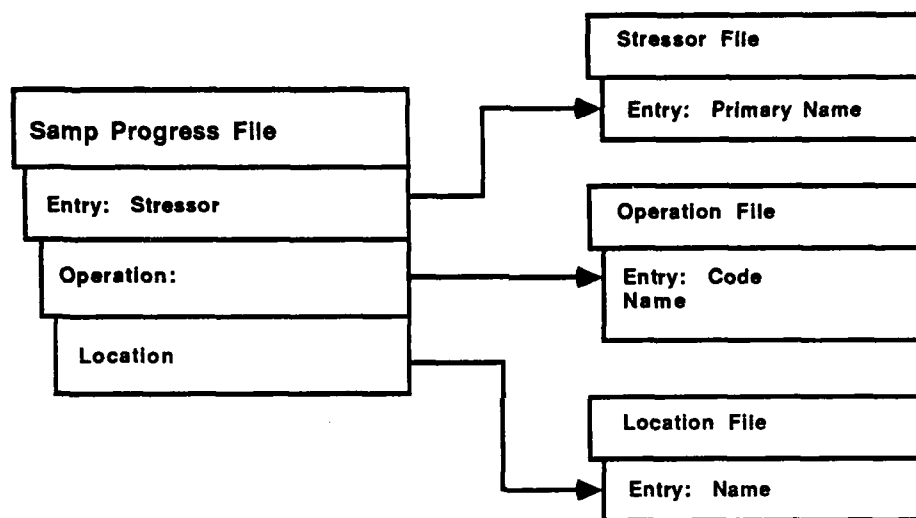
The names of the main routines in the EE module all begin with "T2E". The fourth character of each main routine name identifies a category corresponding to a process being performed. These categories are:

- A - Survey Actions data processes
- B - Boundary data processes
- L - Sample Tracking data processes
- M - Material Inventory data processes
- N - Exposure Notice processes
- Q - Collection Instrument data processes
- S - Walkthrough and Sample Survey data processes
- T - EE Tables maintenance processes
- V - Ventilation Survey data processes



**FIGURE 2-10**  
**SURVEY ACTION FILE RELATIONSHIPS**





**FIGURE 2-11**  
**SAMP PROGRESS FILE RELATIONSHIPS**

Within the above groups, names of routines that produce reports generally have an "R" as the fifth character, followed by a number that distinguishes one routine from another.

In cases where FileMan routines have been tailored specifically for this module, the prefix "T2" has been added to the routine name. Thus, all of these routines will begin with the characters "T2D" followed by the rest of the characters in the routine name.

### 3.0 MODULE MENUS

The Environmental Exposure module options are related to 11 processes:

- Boundary Data - The options in this process are used to record the establishment (opening, reopening) and disestablishment (closing) of boundaries, record employer access to boundaries, and report on boundaries. Boundary information is important in assessing the compliance of personnel with policies limiting the amount of time any employee is allowed work within a bounded area during any quarter and during a year.
- Walkthrough Survey Data - The options in this process are used to record and report on data collected by IH personnel during their walking surveys of the workplace.
- Sample Survey Data - The options in this process are used to record and report on samples collected by IH personnel. These include air samples, direct reading samples, bulk or wipe samples, noise surveys, and heatstress surveys.
- Personal Exposure Assessment - These options are used to determine whether employees have been overexposed to stressors, to report on those individuals whose exposure to stressors is considered potentially hazardous to their health, and to produce exposure notices, as required, for exposed employees.
- Ventilation Survey Data - The options in this process relate to the entry of and reporting on ventilation surveys.
- Material Inventory Survey - The options in this process relate to the entry of and reporting on material inventories.
- Survey Actions Data - The options in this process are used to record notes that IH personnel wish to make regarding follow-up actions relating to surveys, to indicate that all survey actions are completed, and to report on survey actions.
- Sample Tracking - These options are used to track the sending of samples to outside laboratories for analysis and the return of the laboratory reports related to these samples. The options relate both to data entry of samples sent and received and to reports on sample status.

- **Monitoring Planning Support** - The options in this process are used to support the planning of monitoring activities performed by IH personnel. One type of support is provided by the options used to enter data on walkthrough frequency and sampling goals. A second type of support is provided by the options used to generate planning-related reports.
- **Equipment Data** - These options are used to manage the directory of collection instruments at each facility.
- **Support Files Maintenance** - These options are used to maintain key reference files used in this module.

Table 3-1 shows the structure of the module's menus and options. The section number in which each menu option is discussed is shown parenthetically after the option name.

The flexibility of the Kernel's menu system will allow the menu structures to change frequently or be set individually as local sites become familiar with the system's capabilities. Because of this flexibility, the options are presented in terms of the processes discussed above rather than the menu structure.

Appendix A lists the option names with a text description. Appendix B cross references the print templates with the options that use them. Appendix C cross references the sort templates with the options that use them.

TABLE 3-1  
EXPOSURE MODULE MENUS

1. Boundary Management

1. Open Boundary (4.2)
2. Close Boundary (4.4)
3. Reopen Closed Boundary (4.5)
4. Enter Access Log (4.3)
5. Boundary Status Report (4.6)
6. Access Log by Boundary (4.6)
7. Access Log by Stressor (4.6)
8. Access Log for Employee (4.6)

2. Survey Entry

1. Enter/Edit Sample Survey (6.2)
2. Ventilation Survey Entry (8.2)
3. Walkthrough Data Entry (5.2)
4. Material Inventory Entry (9.2)
5. Survey Action Entry (10.2)
6. Survey Action Completion (10.3)

3. Monitoring Planning

1. Walkthrough Frequency Entry (12.3)
2. Enter Sampling Goals (12.4)
3. Walkthroughs Due Report (12.6)
4. Walkthroughs Overdue Report (12.6)
5. Sampling Progress Report (12.5)

4. Equipment Calibration

1. Enter/Edit Collection Instrument (13.2)
2. Record/Edit Calibration for Returned Instrument (13.5)
3. Send Out Instrument for Calibration (13.4)
4. Inactivate an Existing Instrument (13.3)
5. List Equipment Inventory (13.6)
6. List of Instruments Due for Calibration (13.6)
7. Inquire on Collection Instrument (13.6)

TABLE 3-1  
EXPOSURE MODULE MENUS (CONTINUED)

5. Sample Tracking

1. Send Out Samples (11.2)
2. Receive Sample (11.3)
3. Overdue Samples Report (11.4)
4. Outstanding Samples Report (11.4)

6. Employee Reports

1. Create Exposure Notice Form Letter (14.2)
2. Prepare Overexposure Notices (7.4)
3. Annotate Over MSAL Record (7.5)
4. Compile New Over MSALs (7.2)
5. Employee Samples Reports (6.5)
6. Print Over MSAL List (7.3)
7. Print Exposure Notices by Employee (7.6)
8. Overexposure Notice Print (7.6)

7. Samples Reports

1. Detailed Samples Report Functions (6.3)
2. Summary Report of Samples (6.6)
3. Detailed Bulk/Wipe Samples Reports (6.4)
4. Overexposure/Over MSAL Report by Operation (6.8)
5. Overexposure/Over MSAL Report by Location (6.8)
6. Sample Summary Report by Monitor (6.7)
7. Sample Summary Report by Stressor (6.7)

8. Survey Reports

1. Inquire for Survey (5.4)
2. List Locations by Stressor (5.4)
3. Ventilation Survey Reports Functions (8.3)
4. Walkthrough Detail Report Functions (5.4)
5. Walkthrough Summary (by Date) (5.4)
6. Survey Description List (By Survey Number) (5.4)
7. Exposure Risk Report (12.2)
8. Material Inventory Report (By Survey Number) (9.3)
9. Material Inventory Report (By Location) (9.3)
10. Material Location List (9.3)
11. Survey Action Report (10.4)
12. Overdue Survey Actions Report (10.4)

TABLE 3-1  
EXPOSURE MODULE MENUS (CONCLUDED)

9. Environmental Exposure Tables

1. Set Up Respiratory Protection File (15.2)
2. Set Up Collection Instrument Type (15.2)
3. Enter Clinical Data for Stressor (System-Wide Program  
Maintenance Manual)
4. Set Up Laboratory File (15.2)
5. Set Up Material Products File (14.3)

#### 4.0 BOUNDARY DATA PROCESSES

##### 4.1 Introduction to the Boundary Data Processes

The EE module maintains a Boundary file which includes the description and status of each boundary operation as well as the complete record of personnel access to the boundary. Samples collected in a boundary are not included in the Boundary file but are kept instead in the Sample Survey file with all other sample data. The user enters data into the Boundary file, or retrieves data from it, using the options described below.

##### 4.2 Open Boundary Option

###### 4.2.1 Purpose

The Open Boundary option enables the user either to create an entry in the Boundary file or to edit an existing entry.

###### 4.2.2 Overview

The Open Boundary option invokes the routine T2EBOP. This routine uses DIC to find a previous Boundary file entry or to create a new entry in the file. The lookup is screened to find only "Open" boundaries. Then the standard input routine T2GED is invoked using the OPEN BOUNDARY template. A routine structure diagram is shown in Figure 4-1.

###### 4.2.3 Globals Referenced

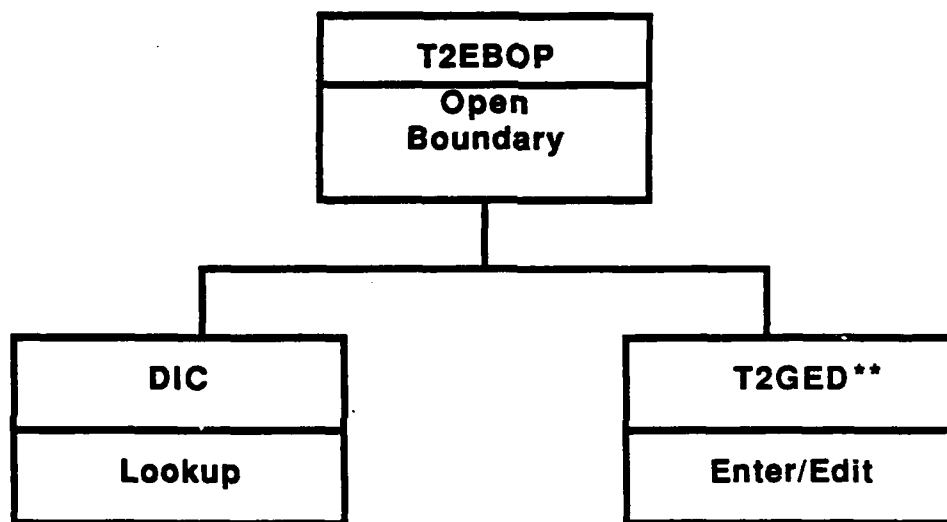
The following files are read and/or updated in the the Open Boundary option:

<u>File Name</u>	<u>Subfile Name</u>	<u>File Number</u>	<u>Global Reference</u>	<u>Module Owner</u>	<u>Read or Update</u>
Boundary	---	1071	↑EBOUND(	EE	Update
Agency Unit	---	1074	↑AGENCY(0,	ADMIN	Read
Location	---	1073	↑AGENCY(1073,	ADMIN	Update
Employee	---	1004	↑EMPLOY(	ADMIN	Read
Stressor	---	1083	↑STRESS(0,	ADMIN	Read

###### 4.2.4 Variables

Only standard T2GED and FileMan variables are used.





**FIGURE 4-1**  
**OPEN BOUNDARY OPTION**  
**ROUTINE STRUCTURE**

#### 4.3 Enter Access Log Option

##### 4.3.1 Purpose

The Enter Access Log option enables the user to enter or edit data from the Boundary Access Logs that are filled out when employees cross into boundaries.

##### 4.3.2 Overview

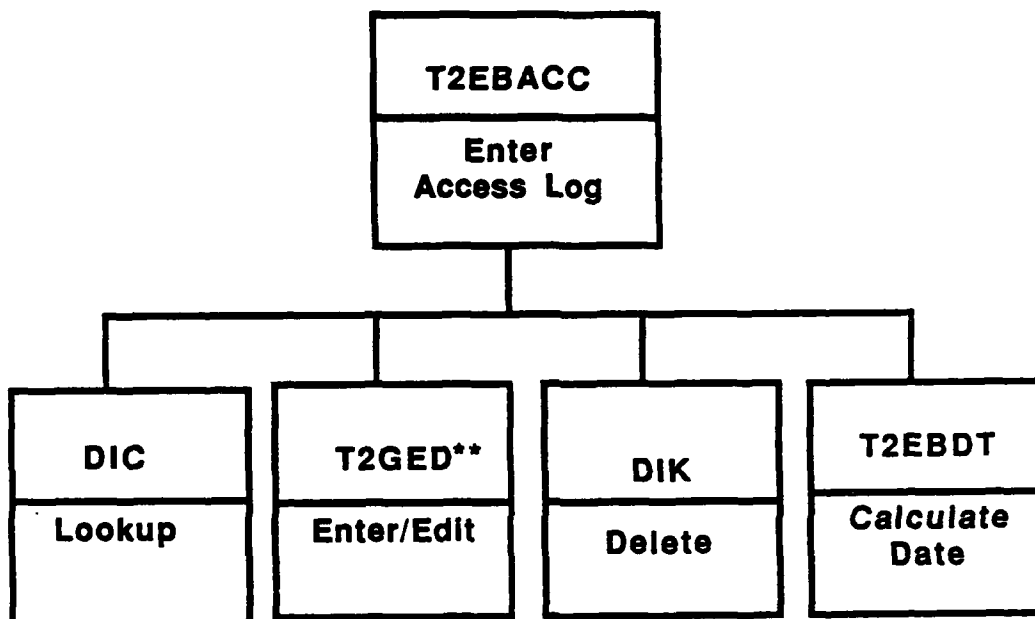
T2EBACC is invoked for the Enter Access Log option. T2EBACC uses DIC to identify the Boundary file entry. Once this entry is selected, the routine looks up the Shift Record Date of the access log and checks this date to ensure that it neither precedes the Date Established nor follows the Date Disestablished. If it passes this consistency check, a lookup is performed in the Shift Record Date multiple to identify the Shift. The Shift and Shift Record Date are again checked to ensure that they neither precede the Date and Shift Established nor follow the Date and Shift Disestablished. (Note: If the boundary has not been recorded as disestablished neither the Date Disestablished nor the Shift and Date Disestablished will be on file.) If either the Shift Record Date consistency check or the Shift and Shift Record Date consistency check fails, the newly created multiple is deleted using DIK. Supervisor and Supervisor Checklist Received fields are entered using T2GED. The Access Log Number (an internal field) is created and recorded in the Shift subfile. A lookup is done on the Employee multiple within the Boundary file entry. By using the Access Log Number, data within the Employee subfile is grouped from a specific access log into a multiple. A lookup using the Access Log Number, with no terminal interaction, is done into the Access Log Number multiple.

The user is prompted to enter the Respirator Type and Boundary Operation fields. For each Time In, a lookup is done with (Learn-as-you-go) LAYGO, and Time Out is entered by the user. T2EBDT is used to convert each Time In and Time Out to a date/time in FileMan format. These calculated date/time fields are recorded in the Time In multiple. Upon entry, Time In and Time Out fields are checked for proper input syntax by T2GTIMM. A routine structure diagram is shown in Figure 4-2.

##### 4.3.3 Globals Referenced

The following files are read and/or updated in this option:

<u>File Name</u>	<u>Subfile Name</u>	<u>File Number</u>	<u>Global Reference</u>	<u>Module Owner</u>	<u>Read or Update</u>
Boundary	---	1071	↑EBOUND(	EE	Update
Respirator	---	1105	↑EXP(1105,	EE	Read
Employee	---	1004	↑EMPLOY(	ADMIN	Read
Operation	---	1087	↑DIZ(1087,	ADMIN	Read



**FIGURE 4-2**  
**ENTER ACCESS LOG OPTION**  
**ROUTINE STRUCTURE**

#### 4.3.4 Variables

The following variables are used:

- EDA: Internal number (DA) of the Boundary file entry
- EDA1: Internal number (DA) of the Shift Record Date multiple
- EDA2: Internal number (DA) of the Shift multiple
- EDDT: Date/Time Established
- EDE1: Internal number (DA) of the Employee multiple
- EDE2: Internal number (DA) of the Access Log Number multiple
- EDSH: Shift Established
- EDT: Shift Record Date in FileMan format
- EEDT: Date/Time Disestablished
- EESH: Shift Disestablished
- ELOG: The automatically calculated Access Log Number
- ESH: Shift
- ETI: The local variable used to pass the time to T2EBDT
- EX: The variable returned from T2EBDT containing Date/Time in FileMan format

#### 4.3.5 Remarks

Once Date/Time In and Date/Time Out are calculated, they are checked to ensure that Date/Time Out does not precede Date/Time In.

#### 4.4 Close Boundary Option

##### 4.4.1 Purpose

The Close Boundary option records the Date/Time Disestablished and Shift Disestablished fields in the Boundary file entry and changes the boundary's status to "Closed."

#### 4.4.2 Overview

The routine T2EBCL is invoked for the Close Boundary option. The lookup into the Boundary file is screened to find only "Open" boundaries. The routine invokes DIQ at its entry point EN1 to display the identifying data about the boundary selected. The template CLOSE BOUNDARY is used to control the data input, using T2GED. A routine structure diagram is shown in Figure 4-3.

#### 4.4.3 Globals Referenced

The following file is updated in this option:

<u>File Name</u>	<u>Subfile Name</u>	<u>File Number</u>	<u>Global Reference</u>	<u>Module Owner</u>	<u>Read or Update</u>
Boundary	---	1071	↑EBOUND(	EE	Update

#### 4.4.4 Variables

Only standard T2GED and FileMan variables are used.

#### 4.4.5 Remarks

Date/Time Disestablished is checked to ensure that it comes after Date/Time Established, and that it comes after the last Shift Record Date, if there are any on file.

There is a separate entry point in the routine T2EBCL for Reopen Closed Boundary. This option is in this routine since it is the inverse process of Close Boundary. The maintenance programmer should consider both of these options in making significant changes to the Close Boundary option. (See also Section 4.5.)

### 4.5 Reopen Closed Boundary Option

#### 4.5.1 Purpose

The Reopen Closed Boundary option allows the user to correct a mistakenly-entered close boundary transaction.

#### 4.5.2 Overview

The entry point OPEN of routine T2EBCL is invoked to reopen a closed boundary. A standard FileMan lookup is done, screening the entries to find only those which are "Closed". T2EBCL invokes DIQ at entry point EN1 to display the identifying data about the boundary selected. After the

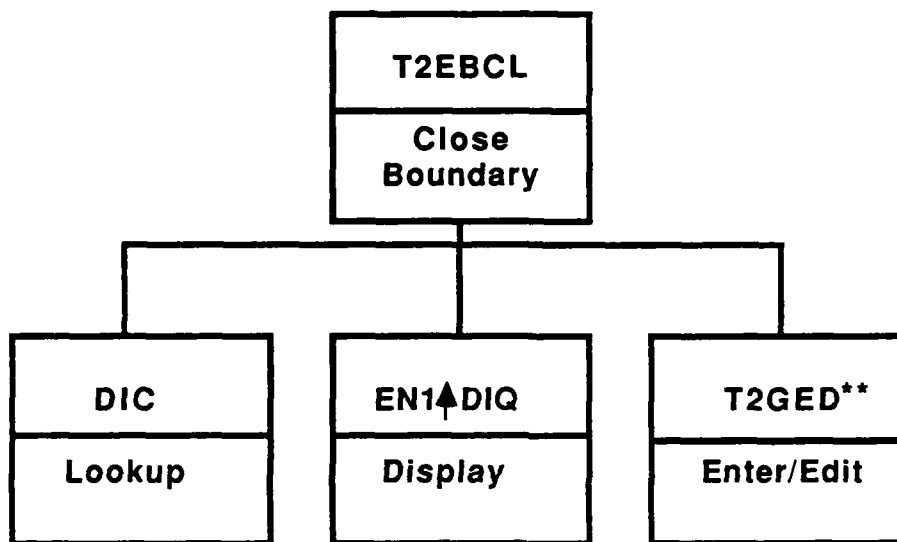


FIGURE 4-3  
CLOSE BOUNDARY OPTION  
ROUTINE STRUCTURE

user is prompted to ensure that the correct boundary has been selected, DIE is invoked to delete the Date/Time Disestablished and Shift Disestablished fields and to reset the boundary's Status to "Open". A routine structure diagram is shown in Figure 4-4.

#### 4.5.3 Globals Referenced

The following file is updated in this option:

<u>File Name</u>	<u>Subfile Name</u>	<u>File Number</u>	<u>Global Reference</u>	<u>Module Owner</u>	<u>Read or Update</u>
Boundary	—	1071	↑EBOUND(	EE	Update

#### 4.5.4 Variables

Only standard FileMan variables are used.

#### 4.5.5 Remarks

The entry point ENT in T2EBCL performs the Close Boundary option. The maintenance programmer should consider the impact of changes on both of these options when making changes to either one. (See also Section 4.4.)

### 4.6 Boundary Reports Options

#### 4.6.1 Purpose

The Boundary Reports options provide reports from the Boundary file, including information identifying both a boundary and employee access to boundaries.

#### 4.6.2 Overview

The Boundary data reports are produced by routines that call DIP with the variables defined to specify a sort template and a print template. Table 4-1 shows the routine, sort template, and print template for each of the report options.

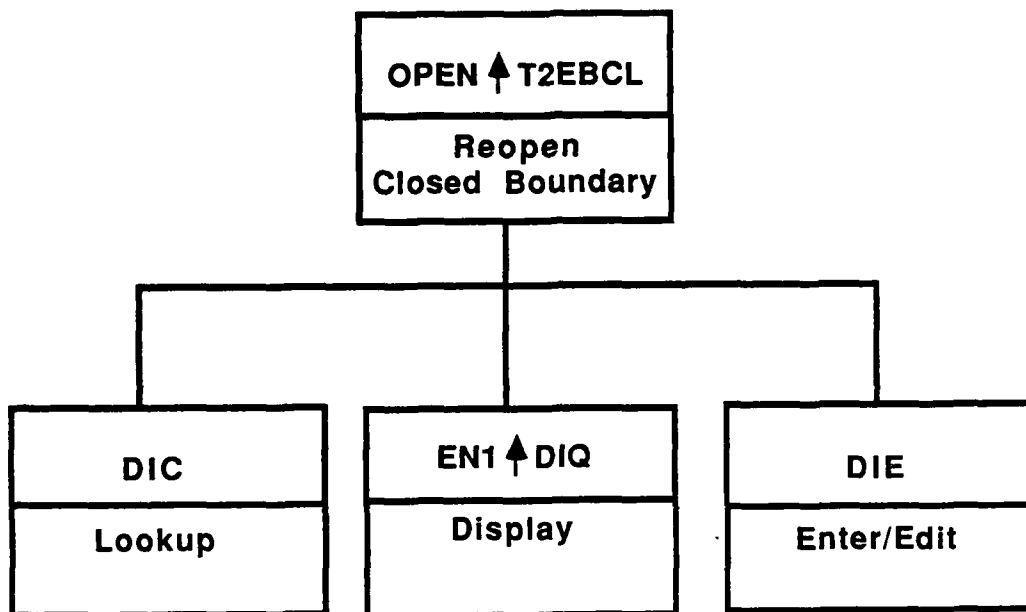


FIGURE 4-4  
REOPEN CLOSED BOUNDARY OPTION  
ROUTINE STRUCTURE



**TABLE 4-1**  
**BOUNDARY DATA REPORTS, ROUTINES, AND TEMPLATES**

REPORT NAME	ROUTINE	SORT TEMPLATE	PRINT TEMPLATE
Boundary Status Report	T2EBR7	BND STATUS	BND STATUS
Access Log for Employee	T2EBR5	ACCESS BY EMP	ACCESS LIST
Access Log by Stressor	T2EBR4	ACCESS BY STR/EMP/#/DATE	ACCESS LIST2
Access Log by Boundary	T2EBR6	ACCESS BY STR/EMP/#/DATE	ACCESS LIST1

#### 4.6.3 Globals Referenced

The following files are used to produce the Boundary Data reports, depending on the fields called for in the print templates:

<u>File Name</u>	<u>Subfile Name</u>	<u>File Number</u>	<u>Global Reference</u>	<u>Module Owner</u>	<u>Read or Update</u>
Boundary	---	1071	↑EBOUND(	EE	Read
Respirators	---	1105	↑EXP(1105,	EE	Read
Stressor	---	1083	↑STRESS(0,	ADMIN	Read
Agency Unit	---	1074	↑AGENCY(0,	ADMIN	Read
Employee	---	1004	↑EMPLOY(	ADMIN	Read
Location	---	1073	↑AGENCY(1073,	ADMIN	Read
Operation	---	1087	↑DIZ(1087,	ADMIN	Read

#### 4.6.4 Variables

Only standard FileMan variables are used.

#### 4.6.5 Remarks

The calculations for Total Hours, Number of Days, and Total Manhours are discussed in Section 16.2 (Calculation of Time in Boundary).

## 5.0 WALKTHROUGH SURVEY DATA OPTIONS

### 5.1 Introduction to the Walkthrough Survey Data Options

The EE module maintains a Walkthrough file which contains data collected during walkthrough surveys. Walkthrough data includes general data about who conducted the survey and when it was conducted, the identification of the locations and operations surveyed, and, for each separate location and operation, the following:

- Machinery
- Physical Hazards
- Engineering Controls
- Other Controls
- Respiratory Protection
- Personal Protective Equipment
- Materials (Products)
- Stressors

The Walkthrough Survey Data options include the ability to enter walkthrough data (including copying data from a previous walkthrough) and create walkthrough reports. These options are described below. During walkthrough data entry, the user may copy walkthrough data from a previous survey. This capability is described separately in the following material.

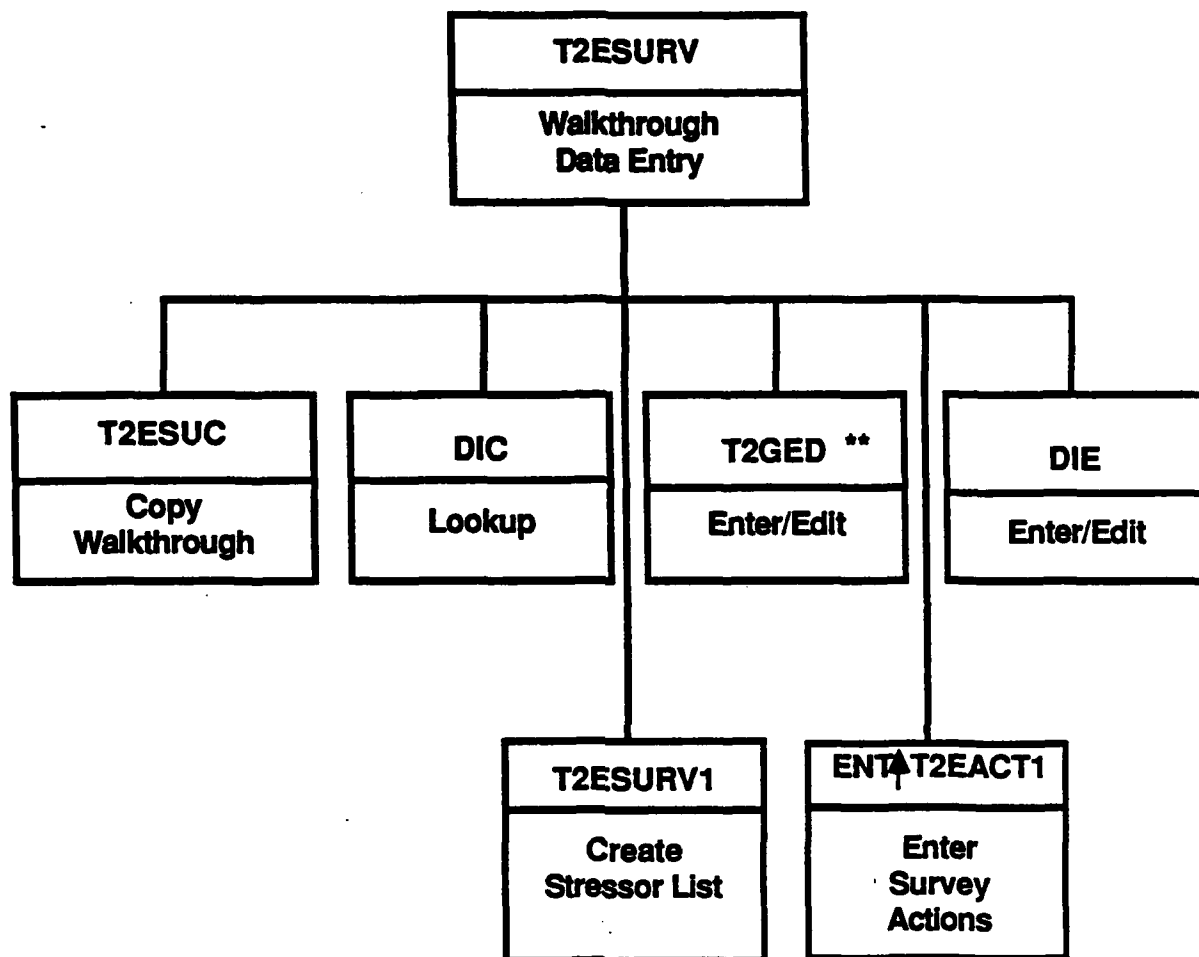
### 5.2 Walkthrough Data Entry Option

#### 5.2.1 Purpose

The Walkthrough Data Entry option enables the user to enter or edit data in the Walkthrough file.

#### 5.2.2 Overview

The Walkthrough Data Entry option invokes the routine T2ESURV. Figure 5-1 illustrates the routine structure for this option. This routine first determines whether the walkthrough data is to be copied from a previous Walkthrough file entry. If the data is to be copied, the Copy



**FIGURE 5-1**  
**WALKTHROUGH DATA ENTRY OPTION**  
**ROUTINE STRUCTURE**

Walkthrough function (T2ESUC) is invoked (see Section 5.3). T2ESURV invokes DIC to find or add the Walkthrough file entry; the file lookup is screened to find only Walkthrough type entries. If the entry is new or the user wishes to edit the cover sheet data, T2GED is invoked for cover sheet entry/edit. Within the Walkthrough file entry, a lookup is done on the Location subfile, then on the Operation subfile within Location. New locations and operations are created during the lookup as necessary. At the Operation subfile level, DIE is invoked to collect the data for the subfiles which occur within the Operation level of the file. The Stressors subfile is created by a call to the routine T2ESURV1. Using the Location name for lookup and screening with the Operation pointer value, the required data is recorded in the Monitoring Plan file, using the template MON STUFF and DIE. The routine then invokes T2ESACT1 for entry of Survey Actions (see Section 10.2).

T2ESURV1 creates a new stressor list in the Stressors subfile from the contents of the Materials and the Other Stressors subfiles of the Walkthrough file entry. To do this it first deletes the previous Stressors subfile. Then, for each entry in the Materials subfile, the stressor contents are recorded in the Stressors subfile of the Walkthrough entry. When this is done, each entry in the Other Stressors subfile is also recorded in the Stressors subfile. The zero node is set to conform to Fileman format (showing last entry and total number of entries).

### 5.2.3 Globals Referenced

The following files are read and/or updated in this option:

<u>File Name</u>	<u>Subfile Name</u>	<u>File Number</u>	<u>Global Reference</u>	<u>Module Owner</u>	<u>Read or Update</u>
Walkthrough	---	1085	↑ESURV(	EE	Update
Survey Monitor	---	1104	↑EXP(1104,	EE	Update
Frequency of Ops	---	1106	↑EXP(1106,	EE	Read
Respirators	---	1105	↑EXP(1105,	EE	Read
Personal Protective Equipment	---	1103	↑EXP(1103,	EE	Read
Product	---	1142	↑EMAT(	EE	Read
Monitoring Plan	---	1114	↑EXP(1114,	EE	Update
Stressor	---	1083	↑STRESS(0,	ADMIN	Read
Location	---	1073	↑AGENCY(1073,	ADMIN	Update
Operation	---	1087	↑DIZ(1087,	ADMIN	Read
Agency Unit	---	1074	↑AGENCY(0,	ADMIN	Read

### 5.2.4 Variables

The following variables are used:

- EACT: Investigator Pointer
- ECOPY: Flag to indicate that the walkthrough entry was copied
- EDUR: Duration of Operation
- EFRE: Frequency of Operation Pointer
- EFROM: From Date field in FileMan format
- ELDA: Internal number (DA) of the Location subfile
- ELOC: Location Pointer
- EMT: Flag to indicate whether Materials subfile data has been entered or edited
- ENUM: Number of Persons at Risk
- EO: Used as a holding area for global data in local storage
- EODA: Internal number (DA) of the Operation subfile
- EOP: Operation Pointer
- ESDA: Internal number (DA) of the Walkthrough file entry
- ESHOP: Shop Pointer
- EST: Flag to indicate whether Other Stressors subfile data has been entered or edited
- ESUR: Survey/Boundary Number
- ETYP: Type ("W" for Walkthrough)

The following variables are used only in the subroutine T2ESURV1:

- E1: Temporary variable used for \$ORDER in Walkthrough file, Materials subfile, and Other Stressors subfile (at different times)
- E2: Temporary variable used for \$ORDER in Products file, Stressors subfile
- EL: Last Stressor pointer set for each Material or for Other Stressors

- ELAST: Highest Stressor pointer
- ETOT: Count of the number of Stressors subfile entries

### 5.3 Copy Walkthrough Function

#### 5.3.1 Purpose

The Copy Walkthrough function copies walkthrough data from one Walkthrough file entry to a new entry and prompts the user for the cover sheet data for the new survey.

#### 5.3.2 Overview

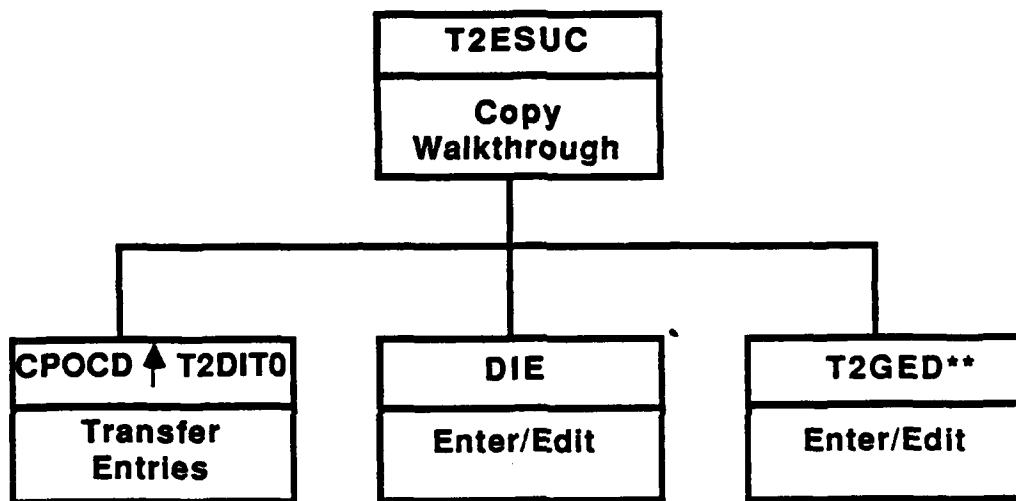
The routine T2ESUC is invoked from T2ESURV when the user chooses to copy the contents of a new walkthrough from a previous Walkthrough file entry. Code lifted from the standard FileMan routines that perform Transfer Entries, i.e., FileMan routines beginning with "DIT", has been modified to copy one Walkthrough file entry to another. The modified routine T2DITO is invoked to begin the copy. The original FileMan routines have been renamed with a "T2" prefix to set them apart from the original versions of the routines. These routines are: T2DICRW, T2DIT, T2DITO, T2DIT1, T2DIT2, T2DIT3, T2DITP, T2DITR, and T2DITR1. Since the flow among the routines is the same as in the FileMan Transfer Entries option\*, the routine flow is not discussed in this manual, but instead only the modifications that were made are described. T2ESUC sets up the variables required by the T2DIT series and invokes T2DITO to accomplish the copy. Fields from the cover sheet are deleted: From Date, To Date, Survey Comment, Special Reason. Then T2GED is invoked with input template MODIFY COPIED SURVEY to allow the user to enter the required cover sheet fields. Figure 5-2 shows the routine structure of the Copy Walkthrough function.

#### 5.3.3 Globals Referenced

The following files are read and/or updated in this option:

<u>File Name</u>	<u>Subfile Name</u>	<u>File Number</u>	<u>Global Reference</u>	<u>Module Owner</u>	<u>Read or Update</u>
Walkthrough	---	1085	↑ESURV(	EE	Update
Survey Monitor	---	1104	↑EXP(1104,	EE	Read

\*This option is described in the FileMan documentation referenced in Section 1.2.



**FIGURE 5-2**  
**COPY WALKTHROUGH OPTION**  
**ROUTINE STRUCTURE**



#### 5.3.4 Variables

The following variables are used:

- DDF(1): File number of the source file
- DDT(0): File number of the destination file
- DFL: Set to prompt text (but not used)
- DKP: Required to be set to 1
- DL: Required to be set to 1
- DMRG: Required to be set to 1
- DTO: Global reference of the destination file
- ECOPY: Flag to indicate that walkthrough copy was done
- ESDA: Internal number (DA) of Walkthrough file entry for new walkthrough
- ESUR: Survey Boundary Number
- GB: Global reference of the file

#### 5.3.5 Remarks

In the OSHRKS version of the FileMan Transfer Entries routines, changes have been made to avoid asking the user for certain data at the beginning of the option (T2DITØ). Occasionally in other routines in the series, changes have been made to keep from writing to or reading from the user's terminal when it isn't necessary. The variables listed in Section 5.3.4 that begin with the letter "D" are ones used in the original FileMan version of these routines. These values are set as indicated to conform to their use in the original routines.

#### 5.4 Walkthrough Reports Options

##### 5.4.1 Purpose

The Walkthrough Reports options generate reports from the Walkthrough file.

#### 5.4.2 Overview

The reports available to show Walkthrough data are created by routines which invoke DIP with sort templates and print templates specified. Table 5-1 shows the routines, sort templates, and print templates used for each of the report options. The last three reports shown in the table are contained in the menu option "Walkthrough Detail Report Functions."

#### 5.4.3 Globals Referenced

The Walkthrough file is the primary file for all of the walkthrough report options. Because the Walkthrough file contains pointer fields, other files may be referenced for a report, depending on the report's contents. The print template of each report indicates in detail the contents of each report. The following files are read and/or updated in this option:

<u>File Name</u>	<u>Subfile Name</u>	<u>File Number</u>	<u>Global Reference</u>	<u>Module Owner</u>	<u>Read or Update</u>
Walkthrough	---	1085	↑ESURV(	EE	Read
Frequency of Ops	---	1106	↑EXP(1106,	EE	Read
Personal Protective Equipment	---	1103	↑EXP(1103,	EE	Read
Product	---	1142	↑EMAT(	EE	Read
Respirators	---	1105	↑EXP(1105,	EE	Read
Survey Monitor	---	1104	↑EXP(1104,	EE	Read
Stressor	---	1083	↑STRESS(0,	ADMIN	Read
Location	---	1073	↑AGENCY(1073,	ADMIN	Read
Operation	---	1087	↑DIZ(1087,	ADMIN	Read
Agency Unit	---	1074	↑AGENCY(0,	ADMIN	Read

#### 5.4.4 Variables

Only standard FileMan variables are used.

TABLE 5-1  
WALKTHROUGH REPORTS, ROUTINES, AND TEMPLATES

REPORT NAME	ROUTINE	SORT TEMPLATE	PRINT TEMPLATE
Survey Description List (by Survey Number)	T2ESR1	---	WALK SUM
Walkthrough Summary (by Date)	T2ESR3	WALK BY DATE	WALK SUM
Inquire for Survey	T2ES1	---	WALK DETAIL
List Locations by Stressor	T2ESR21	BY STRESSOR	LOCS BY STRESSOR
Walkthrough by Location/ Operation	T2ESR2	WALK BY LOC/OP	LOC/OP DETAIL
Walkthrough by Operation/ Location	T2ESR9	WALK BY OP/LOC	OP/LOC DETAIL
Walkthrough Results (By Survey Number)	T2ESR20	WALK BY NUMBER	WALK DETAIL

## 6.0 SAMPLE SURVEY DATA OPTIONS

### 6.1 Introduction to the Sample Survey Data Options

The Sample Survey data options deal with the Sample Survey file. These options provide the capability to enter sample survey data into the file and to create reports from the file. This data includes air samples, direct reading samples, noise surveys, heatstress surveys, bulk samples, and wipe samples. The Sample Survey file contains several levels of multiples to represent the data. One survey may cover several locations, operations, and/or dates. It may be conducted by more than one monitor. Each time a new location or operation is surveyed, or the date changes, or a new monitor conducts the survey, a new Industrial Hygiene Cover Sheet is filled out. This form corresponds to the Document Number multiple in the file.

Within one Document Number, a series of pages may exist. These pages correspond to the specific samples or group of samples collected. For instance, a single page is generally used to record sample data collected, using a specific collection instrument, on a single employee. If samples are collected using multiple collection instruments, or for multiple employees, then the sampling data are recorded on several pages. Of course, when samples are of different classes (e.g., air, direct reading), then a separate page exists for each.

The Sample Survey file contains a different multiple for bulk and wipe samples (i.e., the Bulk/Wipe Page Number subfile) than for the measurements for air, direct reading, noise, and heatstress samples (i.e., Page Number subfile) because the results obtained in bulk and wipe sample classes are neither analyzed against limits set for exposure to stressors nor specific employees designated. Sometimes bulk or wipe samples are taken to identify the stressors present. In these cases, the results may not be expressed in terms of concentrations, but simply may be raw data, e.g., milligrams.

At the time that air, direct reading, noise, and heatstress measurements are entered into the file, the results being entered are evaluated against the limits in the Stressor file. A series of fields in the Stressors subfile is created which tells the results of this evaluation "at entry". The fields are named to distinguish which limit was checked and to show that the evaluation was done at the time of entry. The subfile also has a separate set of computed fields containing the evaluation against the limits of the Stressor file "now", i.e., at the time the field is printed or reviewed. These fields have been created to support ad hoc reporting that may require a reevaluation of the results against current limits. (See Section 16.3 for documentation of this calculation). The options by which the user enters data into the Sample Survey file or creates reports from the file are described below.

## 6.2 Enter/Edit Sample Survey Option

### 6.2.1 Purpose

The Enter/Edit Sample Survey option enables the user to enter the quantitative data collected during surveys. Often this quantitative data is related to a physical sample collected, but occasionally (as in the case of noise surveys and heatstress surveys) no physical sample exists. Entry of the measurements of concentrations of a stressor is done in this option, whether there is a physical sample or not. Sample Survey data includes: air samples, direct reading samples, noise surveys, heatstress surveys, bulk samples, and wipe samples.

### 6.2.2 Overview

The routine T2ESAB performs the Enter/Edit Sample Survey option. Figure 6-1 shows the routine structure of the option. The activities of each routine are discussed below.

T2ESAB is the top level routine for the Enter/Edit Samples option. It prompts the user to identify the Sample Survey file entry (or LAYGO a new one) and enter or edit the Document Number fields. Enter Survey Actions (routine T2EACT1 at entry point ENT) is invoked (see Section 10.2). The user is prompted to identify the sample class of the new entry, and the page number. The routine corresponding to the sample class (in the range T2ESAB1 to T2ESAB6) is invoked. Upon return, the user is prompted for another sample class.

T2ESAB1 controls the entry of air samples. The routine is initiated after the Page Number multiple has been identified. Its first activity is to enter or edit the data within the Page Number entry. Then the routine determines whether the sample is for a Personal or General Area type of sample. If it is a Personal sample, the Employee Sampled fields are entered. If it is a General Area sample, any existing Employee Sampled fields are deleted from the entry. The STR paragraph of the code prompts the user to enter the Stressors multiple fields. For each Stressors subfile entry, T2ESACU1 is invoked to evaluate the value of the Result field against the limits from the Stressor file, and to set the "At Entry" limits fields in the subfile entry. The OTH paragraph prompts the user to enter the employees "in area" into the EMP-X multiple of the file.

T2ESAB2 controls the entry of direct reading samples. The logic of the flow is identical to the routine T2ESAB1. See the above description.

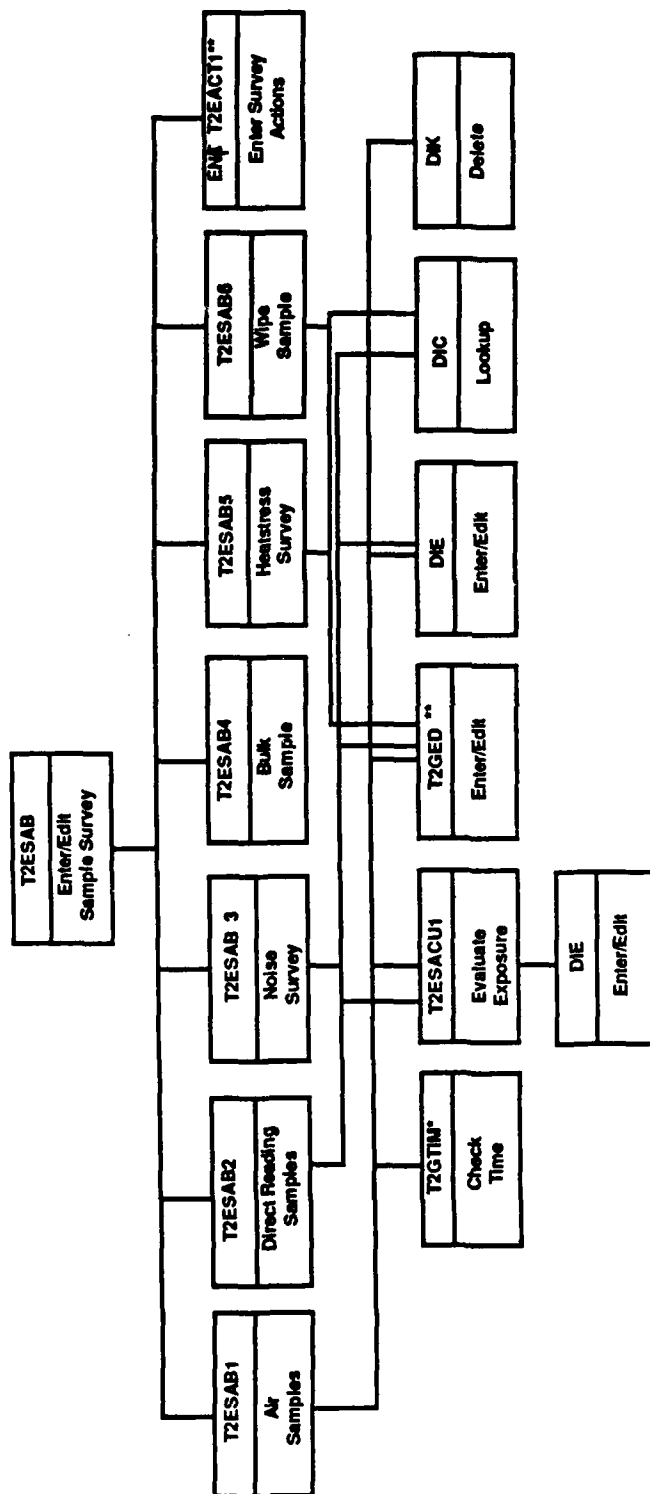


FIGURE 6-1  
ENTER/EDIT SAMPLE SURVEY OPTION  
ROUTINE STRUCTURE

T2ESAB3 controls the entry of noise surveys. The routine begins after the Page Number multiple has been identified. The first activity is to enter or edit the data within the Page Number entry. Then the routine determines if the sample is for a Personal or General Area type of sample. If it is a Personal sample, the Employee Sampled fields are entered. If it is a General Area sample, any existing Employee Sampled fields are deleted from the entry. (To this point T2ESAB3 is similar to T2ESAB1 and T2ESAB2). If the noise survey contains personal sample data, the routine prompts the user to enter LEQ DBA, LEQ Peak, and Percent Exposure fields from the form. Each of these fields is set in the file as a Stressors subfile entry for Noise. Once an entry is made in the Stressors subfile, the result value is evaluated by T2ESACU1. If the user does not enter data for one of these fields, the appropriate subfile entry is deleted by DIK. Beginning at the tag STR2, the routine is used for both Personal and General Area noise surveys. At SOU, the Sound Level data is entered from the form. Again, the routine constructs a Stressors subfile entry for the data being entered from each line of the form. T2GTIM is invoked for each Time of Day to check the field's validity. Again, T2ESACU1 is invoked to evaluate the result value against the limits from the Stressors file. Once the Sound Level data is entered, the routine gets the Noise Source and Noise Radius fields for the Page Number subfile. As in the previous routines, the paragraph OTH prompts for the EMP-X subfile entries. Once these entries are completed, the entry sequence for that page is complete.

T2ESAB4 controls the entry of bulk samples. T2ESAB5 controls the entry of heatstress surveys. T2ESAB6 controls the entry of wipe samples.

T2ESACU1 evaluates the stressor results against the appropriate limits to create the values for the over limit "at entry" fields in the Stressors multiple.

T2EACT1 at entry point ENT is invoked to allow the user to enter survey actions. See Section 10.2 for the technical description of this activity.

### 6.2.3 Globals Referenced

The following files are read or updated in this option:

<u>File Name</u>	<u>Subfile Name</u>	<u>File Number</u>	<u>Global Reference</u>	<u>Module Owner</u>	<u>Read or Update</u>
Sample Survey	---	1124	↑ESAMP(	EE	Update
Survey Monitor	---	1104	↑EXP(1104,	EE	Update

Frequency of Ops	---	1106	↑EXP(1106,	EE	Read
Collection Instrument	---	1086	↑EXP(1086,	EE	Read
Respirators	---	1105	↑EXP(1105,	EE	Read
Personal Protective Equipment	---	1103	↑EXP(1103,	EE	Read
Sample Progress	---	1121	↑EXP(1121,	EE	Update
Stressor	---	1083	↑STRESS(0,	ADMIN	Read
Sample Units	---	1101	↑EXP(1101,	ADMIN	Read
Location	---	1073	↑AGENCY(1073,	ADMIN	Update
Operation	---	1087	↑DIZ(1087,	ADMIN	Read
Employee	---	1004	↑EMPLOY(	ADMIN	Read
Agency Unit	---	1074	↑AGENCY(0,	ADMIN	Read

#### 6.2.4 Variables

The variables used are the following:

- EACT: Investigator pointer
- EAG: Pointer to activity
- ECON: Document Number
- ED0: Internal number (DA) of the Sample Survey file entry
- ED1: Internal number (DA) of the Document Number multiple
- ED2: Subscript value to distinguish between Page Number (subscript 100) and Bulk/Wipe Page Number (subscript 200)
- ED2N: Subfile number of Page Number or Bulk/Wipe Page Number
- ED3: Internal number (DA) of Page Number or Bulk/Wipe Page Number subfile entry
- EFROM: Date (from Document Number)
- ELIN: Stressors multiple string used in Sound Level data entry only
- ELOC: Location pointer
- EMPOP: Operation pointer in Document Number subfile
- EMPOPT: Text of Operation field from Document Number subfile



- EMPS: Employee Sampled pointer
- EO: Temporary holding area for Document Number subfile entry
- EOP: Operation pointer
- ERES: Results field of Stressors subfile
- EROU: Subroutine name for specific sample class
- ES: Page Number multiple string used in LIST within T2ESAB
- ESCL: Sample Class
- ESHOP: Shop pointer
- ESUR: Survey/Boundary Number
- ETIM: Formatted value for Time of Day field (from T2GTIM)
- ETYP: Type of Sample field of Page Number multiple, also Survey Type (for Survey Action file entry)
- EYO: Page Number subfile entry

The following variables are used in routine T2ESACU1:

- ELIM array: (Subscripted by Stressor pointer, Units pointer)  
contains the Units subfile entry of the Stressor file
- EMSAL: MSAL limit of the appropriate Result Type for the Stressor and Units of the Stressors subfile entry being evaluated
- ENAV: Navy limit of the appropriate Result Type for the Stressor and Units of the Stressors subfile entry being evaluated
- EOLIM: Value of Over Limit at Entry field (0 or 1)
- EOMSAL: Evaluation of Result field of the Stressors multiple against the appropriate "MSAL" limit equals: "N/A" if there is no MSAL limit, 1 if Result is not less than MSAL limit, otherwise 0
- EONAV: Evaluation of Result field of the Stressors multiple against the appropriate "Navy" limit equals: "N/A" if there is no Navy limit, 1 if Result is not less than Navy limit, otherwise 0

- EOTH: Evaluation of Result field of the Stressors multiple against the appropriate "Other" limit equals: "N/A" if there is no Other limit, 1 if Result is not less than Other limit, otherwise 0
- EOPEL: Evaluation of Result field of the Stressors multiple against the appropriate "PEL" limit equals: "N/A" if there is no PEL limit, 1 if Result is not less than PEL limit, otherwise 0
- EOTH: Other limit of the appropriate Result Type for the Stressor and Units of the Stressors subfile entry being evaluated
- EOTHN: Name of the authority for the Other limit of the appropriate Result Type for the Stressor and Units of the Stressors subfile entry being evaluated
- EOTLV: Evaluation of Result of the Stressors multiple against the appropriate "TLV" limit equals: "N/A" if there is no TLV limit, 1 if Result is not less than TLV limit, otherwise 0
- EOVER: Limit used to determine whether the result is an overexposure in accordance with the rules of precedence of limits (Section 6.2.5)
- EPEL: PEL limit of the appropriate Result Type for the Stressor and Units of the Stressors subfile entry being evaluated
- ERES: Results field of Stressors subfile
- ESTR: Stressors subfile entry from Sample Survey file--stripped to become the Stressor pointer value
- ESTY: Results field of the Stressors subfile
- ETLV: TLV limit of the appropriate Result Type for the Stressor and Units of the Stressors subfile entry being evaluated
- EUN: Subscript of Units subfile in the Stressor file which matches the value of the Units field in the Sample Survey file Stressors subfile
- EUNIT: Units field of the Stressors subfile

### 6.2.5 Remarks

Indirection has been used in the routine T2ESAB to invoke the appropriate subroutine based on the class of samples being entered. This is a typical use of the indirection capability of MUMPS.

Evaluation of stressor limits to determine overexposure is done according to the following rules of precedence:

- If there is a "Navy" limit—evaluate result against "Navy" limit
- Else, if there is a "PEL" limit—evaluate result against "PEL" limit
- Else, if there is a "TLV" limit—evaluate result against "TLV" limit
- Else, if there is an "Other" limit—evaluate result against "Other" limit

T2SEMP is triggered from the Employee field of the EMP-X subfile. This routine resets the Date Entered field so that reevaluation of the stressor results will occur during the next Over MSAL compile.

T2ESPG is triggered from the Result Type field of the Stressors subfile if the Result Type is "TWA". If the Result Type is deleted, entry point SUB in T2ESPG is invoked.

Date Entered is triggered from the Result field of the Stressors subfile.

## 6.3 Detailed Samples Report Functions

### 6.3.1 Purpose

The Detailed Samples Report Functions produces reports that show, in full detail, the sample survey data entered for air samples, direct reading samples, noise surveys, and/or heatstress surveys, in a user-selected sequence.

### 6.3.2 Overview

The routine T2ESR17 produces the Detailed Samples reports. The routine uses a table of available sort/print options from which the user may select the sort sequence desired. Each option line in the table also contains the values for the DIP variables FLDS, BY, FR, TO, and DHD. Once the user has entered the selection, T2ESR17 sets the FileMan variables and invokes DIP to do the printing.

### 6.3.3 Globals Referenced

The following files are read in this option:

<u>File Name</u>	<u>Subfile Name</u>	<u>File Number</u>	<u>Global Reference</u>	<u>Module Owner</u>	<u>Read or Update</u>
Sample Survey	---	1124	↑ESAMP(	EE	Read
Collection Instrument Type	---	1094	↑EXP(1094,	EE	Read
Collection Instrument	---	1086	↑EXP(1086,	EE	Read
Frequency of Ops	---	1106	↑EXP(1106,	EE	Read
Personal Protective Equipment	---	1103	↑EXP(1103,	EE	Read
Respirators	---	1105	↑EXP(1105,	EE	Read
Sampling Strategy	---	1112	↑EXP(1112,	EE	Read
Survey Monitor	---	1104	↑EXP(1104,	EE	Read
Stressor	---	1083	↑STRESS(0,	ADMIN	Read
Sample Units	---	1101	↑EXP(1101,	ADMIN	Read
Location	---	1073	↑AGENCY(1073,	ADMIN	Read
Operation	---	1087	↑DIZ(1087,	ADMIN	Read
Agency Unit	---	1074	↑AGENCY(0,	ADMIN	Read
Employee	---	1004	↑EMPLOY(	ADMIN	Read

### 6.3.4 Variables

Only standard FileMan variables are used.

## 6.4 Detailed Bulk/Wipe Samples Reports

### 6.4.1 Purpose

The Detailed Bulk/Wipe Samples Reports option produces reports showing the data entered on bulk samples and/or wipe samples, in a user-selected sequence.

### 6.4.2 Overview

The routine T2ESR19 produces the Detailed Bulk/Wipe Samples reports. The routine uses a table of available sort/print options from which the user may select the sort sequence desired. Each option line in the table also contains the values for the DIP variables FLDS, BY, FR, TO, and DHD. Once the user has entered the selection, T2ESR19 sets the FileMan variables and invokes DIP to do the printing.

### 6.4.3 Globals Referenced

The following files are read in this option:

<u>File Name</u>	<u>Subfile Name</u>	<u>File Number</u>	<u>Global Reference</u>	<u>Module Owner</u>	<u>Read or Update</u>
Sample Survey	---	1124	↑ESAMP(	EE	Read
Frequency of Ops	---	1106	↑EXP(1106,	EE	Read
Personal Protective Equipment	---	1103	↑EXP(1103,	EE	Read
Respirators	---	1105	↑EXP(1105,	EE	Read
Survey Monitor	---	1104	↑EXP(1104,	EE	Read
Stressor	---	1083	↑STRESS(0,	ADMIN	Read
Location	---	1073	↑AGENCY(1073,	ADMIN	Read
Operation	---	1087	↑DIZ(1087,	ADMIN	Read
Agency Unit	---	1074	↑AGENCY(0,	ADMIN	Read

### 6.4.4 Variables

Only standard FileMan variables are used.

## 6.5 Employee Samples Reports

### 6.5.1 Purpose

The Employee Samples Reports option produces reports showing any sample data entered in which the employee was either the employee sampled or an other employee in the area at the time of sampling. This data is available in a user-selected sequence.

### 6.5.2 Overview

The routine T2ESR16 produces the Employee Samples reports. The routine uses a table of available sort/print options from which the user may select the sort sequence desired. Each option line in the table also contains the values for the DIP variables FLDS, BY, FR, TO, and DHD. Once the user has entered the selection, T2ESR16 sets the FileMan variables and invokes DIP to do the printing.

### 6.5.3 Globals Referenced

The following files are read in this option:

<u>File Name</u>	<u>Subfile Name</u>	<u>File Number</u>	<u>Global Reference</u>	<u>Module Owner</u>	<u>Read or Update</u>
Sample Survey	---	1124	↑ESAMP(	EE	Read
Agency Unit	---	1074	↑AGENCY(0,	ADMIN	Read
Location	---	1073	↑AGENCY(1073,	ADMIN	Read
Employee	---	1004	↑EMPLOY(	ADMIN	Read
Stressor	---	1083	↑STRESS(0,	ADMIN	Read
Sample Units	---	1101	↑EXP(1101,	ADMIN	Read

### 6.5.4 Variables

Only standard FileMan variables are used.

## 6.6 Summary Report of Samples

### 6.6.1 Purpose

The Summary Report of Samples option produces a report that shows sample results for air, direct reading, noise, or heatstress measurements, in sequence by Stressor, Location, and Operation.

### 6.6.2 Overview

The routine T2ESR5 produces the Summary Report of Samples report. The sort template BY STR/LOC/OP/DATE is used with the print template SAMPLE SUMM. The user is prompted to modify the report title if desired. DIP is used to do the printing.

### 6.6.3 Globals Referenced

The following files are read in this option:

<u>File Name</u>	<u>Subfile Name</u>	<u>File Number</u>	<u>Global Reference</u>	<u>Module Owner</u>	<u>Read or Update</u>
Sample Survey	---	1124	↑ESAMP(	EE	Read
Location	---	1073	↑AGENCY(1073,	ADMIN	Read
Operation	---	1087	↑DIZ(1087,	ADMIN	Read
Stressor	---	1083	↑STRESS(0,	ADMIN	Read
Sample Units	---	1101	↑EXP(1101,	ADMIN	Read

#### 6.6.4 Variables

Only standard FileMan variables are used.

### 6.7 Sample Summary Reports

#### 6.7.1 Purpose

The Sample Summary Reports option provides a report which shows the number of personal or general area samples collected for each result type (e.g., TWA, STEL, Ceiling/Peak, Other). The report is available to show these counts for monitors or for stressors and locations.

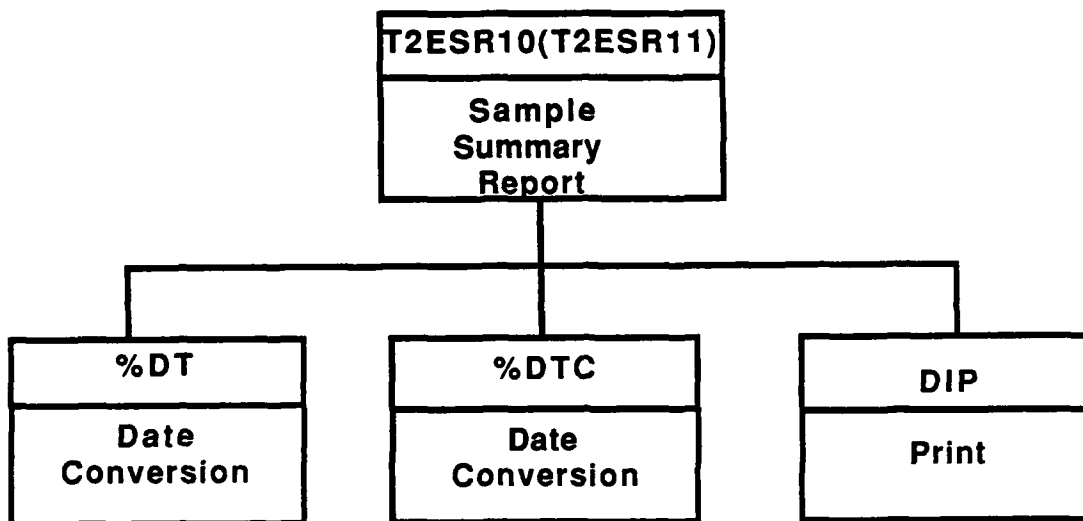
#### 6.7.2 Overview

The Sample Summary Reports are invoked via two different routines: T2ESR10 and T2ESR11, depending on the grouping of data desired by the user. T2ESR10 produces the report grouping the data by monitor; T2ESR11 groups the data by stressor and location.

In T2ESR10, the user is prompted to select whether the report desired is the standard report (all monitors for the specified month) or a special report (the user selects which monitor is to be reported and may select a date range). The user then identifies the month for which the report is to be produced. The routine uses %DT and %DTC to convert the month to FileMan format. For the standard report, the print template MONTHSAM and the sort template MONITOR are used. The date range is inserted into the FR and TO fields. The header template MON STD SAMPLES HEADING is used. For the special report, the print template MONTHSAM and the sort template SPECMONITOR are used. The header template SPEC SAMPLES REPORT HEADING is used. The user is prompted for the date range. In either case, DIP is called to perform the printing.

In T2ESR11, the user is prompted to select whether the report desired is the standard report (all stressors and locations for the specified month) or a special report (the user selects which stressors and locations are to be reported and may select a date range). The user then identifies the month for which the report is to be produced. The routine uses %DT and %DTC to convert the month to FileMan format. For the standard report, the print template STR STD MONTHLY REPORT and the sort template BY DATE/STR/LOC are used. The header template STD STR HEADING is used. For the special report, the print template STR STD MONTHLY REPORT and the sort template BY DATE/STR/LOC are used. The header template SPC STR HEADING is used. The user is prompted for the date range. In either case, DIP is called to perform the printing.

The routine structure which is parallel for T2ESR10 and T2ESR11, is shown in Figure 6-2.



**FIGURE 6-2**  
**SAMPLE SUMMARY REPORTS OPTION**  
**ROUTINE STRUCTURE**



### 6.7.3 Globals Referenced

The following files are read in this option:

<u>File Name</u>	<u>Subfile Name</u>	<u>File Number</u>	<u>Global Reference</u>	<u>Module Owner</u>	<u>Read or Update</u>
Sample Survey	---	1124	↑ESAMP(	EE	Read
Survey Monitor	---	1104	↑EXP(1104,	EE	Read
Location	---	1073	↑AGENCY(1073,	ADMIN	Read
Stressor	---	1083	↑STRESS(0,	ADMIN	Read

### 6.7.4 Variables

Only standard FileMan variables are used.

### 6.7.5 Remarks

The print template MONTHSAM executes fields 21 through 29 in the Sample Survey file. These are computed fields, and in this situation these fields contain MUMPS code. Field 21 specifies that routine T2ESR12 be executed to store data in an array labelled ETOT. The address of each node of the array consists of a two-part designation of the type of sample: "GA" for general area and "PER" for personnel, concatenated with a one-letter designation of the result type. Computed fields 22-28 are then used by the print template MONTHSAM to print for each monitor or stressor/location the detail line data. Each field specifies the local variable X, which FileMan uses for printing a value, for a specific node in ETOT. Field 29 specifies that routine T2ESR12 be executed at line tag EN1 to compute the total for each monitor or stressor location.

## 6.8 Overexposure/Over MSAL Reports

### 6.8.1 Purpose

The Overexposure/Over MSAL Reports option produces reports for management that count the number of samples collected for which the results are over the limits of the Stressor file.

### 6.8.2 Overview

Depending on the sort sequence desired, either T2ESR15 or T2ESR15A produces the Overexposure/Over MSAL Report. The logic is similar for the two reports with the exception that T2ESR15 gathers data by Operation and T2ESR15A gathers data by Location. First the user is prompted for the

date range which the report should cover. This is done in paragraph DATE of the code. Then the user specifies the Site that the report should cover. Next the user identifies whether the report is for one stressor or for all stressors. The user identifies whether the report should show all Operations (Locations in T2ESR15A) or a single one. The routine uses the Date (sampled) cross reference of the Sample Survey file to loop through the file entries and determine whether they should be counted or not. Counts are stored in the UTILITY global prior to printing the report (see Section 6.8.5) The routine structures for these two reports are shown in Figures 6-3 and 6-4.

### 6.8.3 Globals Referenced

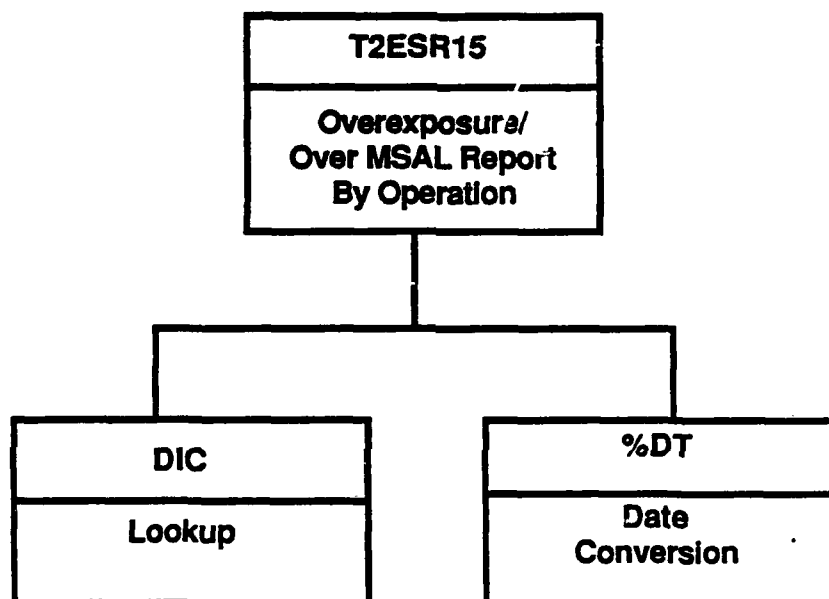
The following files are read and/or updated in this option:

<u>File Name</u>	<u>Subfile Name</u>	<u>File Number</u>	<u>Global Reference</u>	<u>Module Owner</u>	<u>Read or Update</u>
Sample Survey	---	1124	↑ESAMP(	EE	Read
---	---	---	↑UTILITY(	EE	Update
Site	---	1041	↑AGENCY(1041,	ADMIN	Read
Location	---	1073	↑AGENCY(1073,	ADMIN	Read
Operation	---	1087	↑DIZ(1087,	ADMIN	Read
Stressor	---	1083	↑STRESS(0,	ADMIN	Read

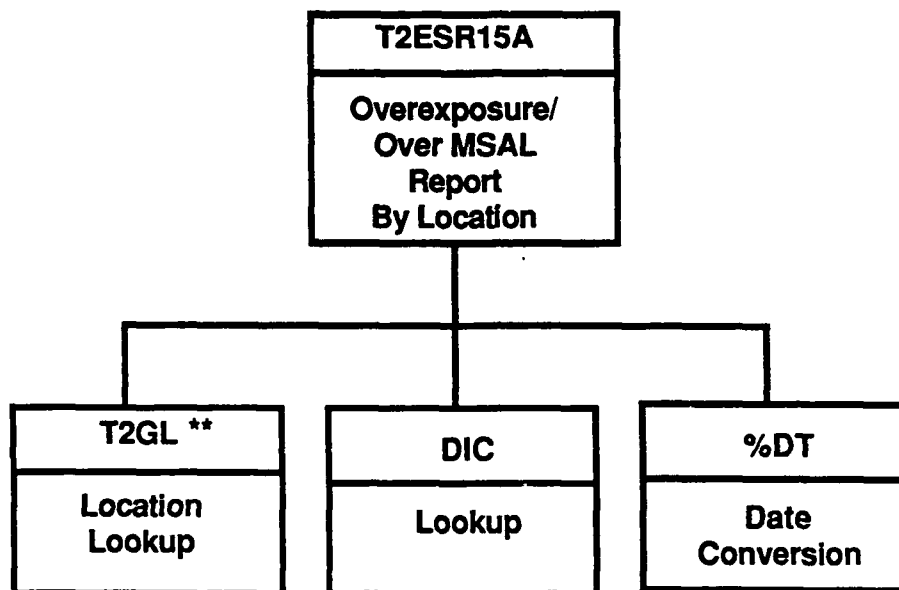
### 6.8.4 Variables

The following variables are used:

- A array: Local storage area used to hold detail line column data
- D: Print column location
- DATE: Date sampled in FileMan format
- ECON: Document Number multiple entry number
- EDATE: End date of report in FileMan format
- EPG: Page Number multiple entry number
- ESTR: Stressors multiple entry number
- ESTRESS: Primary Name of stressor selected by user for report, only defined if user has asked for the report for a specific stressor
- ESURV: Sample Survey file entry number



**FIGURE 6-3**  
**OVEREXPOSURE/OVER MSAL REPORT BY OPERATION OPTION**  
**ROUTINE STRUCTURE**



**FIGURE 6-4**  
**OVEREXPOSURE/OVER MSAL REPORT BY LOCATION OPTION**  
**ROUTINE STRUCTURE**

- HEAD: Five piece string containing names of limit types, used during report header printing
- LC: Page line counter
- LOC: Location pointer (for report by location)
- NODE: Local storage area used for Stressors multiple string in paragraph STLP, and for UTILITY global node in paragraph LINE
- OP: Operation pointer (for report by operation)
- PEDATE: External form of report ending date
- PLOC: Location name
- POP: Operation name
- PSDATE: External form of report starting date
- PSIR: Primary Name of stressor
- RES: Result Type field from Stressors multiple entry
- RET array: Local storage area for counting overexposure/over MSAL results
  - Subscript value = 2 - Over MSAL at entry
  - Subscript value = 3 - Over Navy at entry
  - Subscript value = 4 - Over PEL at entry
  - Subscript value = 5 - Over TLV at entry
  - Subscript value = 6 - Over Other at entry
- SDATE: Report starting date in FileMan format
- SITE: Site name of site selected by user
- SPLOC: Location pointer (for report by location)
- STR: Stressor pointer
- TOT array: Local storage area used to accumulate total amount for a stressor or location

## 7.0 PERSONAL EXPOSURE ASSESSMENT OPTIONS

### 7.1 Introduction to the Personal Exposure Assessment Options

Exposure measurements are maintained in the Sample Survey file. At the time the sample data is entered, the system automatically evaluates the results of the appropriate limits (as recorded in the Stressor file). When a result equals or exceeds an established limit, certain fields are set in the Stressors subfile entry to indicate an "over limit" condition. The options in this section are all dependent on this evaluation having been done correctly when the sample data was entered.

The first step in personal exposure assessment is to review the "over limit at entry" fields for newly entered samples, and create Over MSAL Results entries for over-limit results (see Section 7.2). Once the Over MSAL Results file entries exist, the user may: print Over MSAL reports; set up and print exposure notices; and indicate in the Over MSAL Results file why an entry is not being used for an exposure notice. The following sections describe these options.

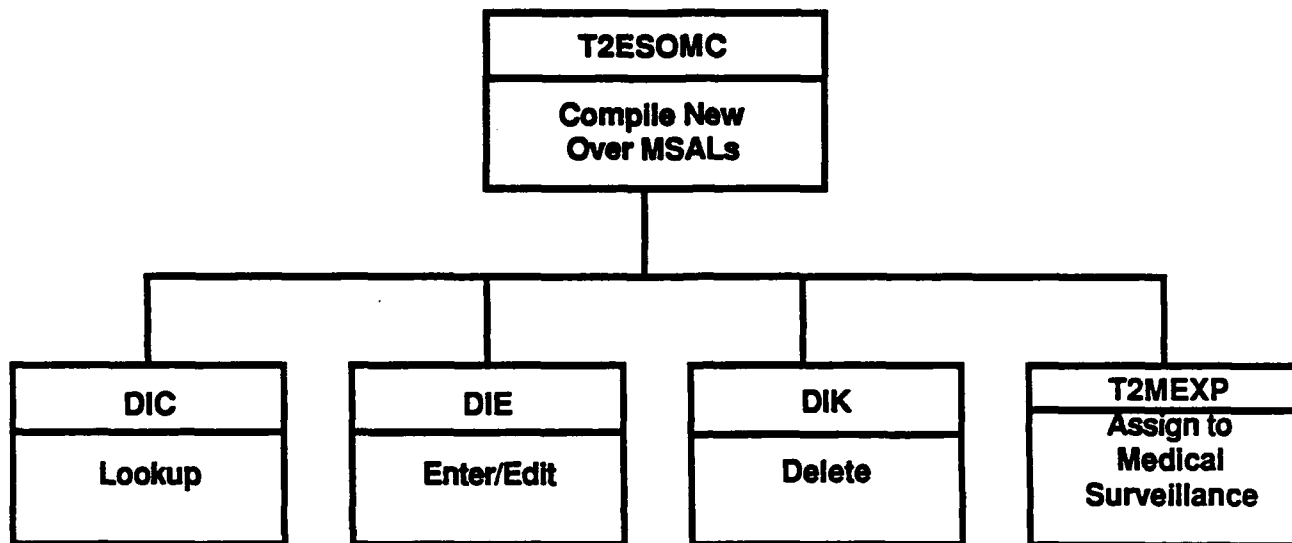
### 7.2 Compile New Over MSALs Option

#### 7.2.1 Purpose

The Compile New Over MSALs option evaluates each newly entered sample survey result and creates an Over MSAL Results file entry for each one that exceeds a stressor limit. If the stressor result is associated with any employees (either Employee Sampled or In Area), then a function of the MES module is invoked which performs the appropriate scheduling activity for each affected employee, based on the stressor requirements. (See the Medical Exam Scheduling Program Maintenance Manual.)

#### 7.2.2 Overview

The routine T2ESOMC performs the evaluation of newly-entered stressor results. The routine structure is shown in Figure 7-1. T2ESOMC determines the Over MSAL Number (.01 value) to assign to new entries based on the last number used, as stored in the global ↑GCNT. ↑GCNT also indicates when the last compile was run and whether it ran to completion. Before the Over MSAL Number is set, T2ESOMC checks to ensure that the last compile was completed. If it was not, all entries from that compile are deleted using DIK and the next Over MSAL Number is set to compile from the beginning of the uncompleted compile. After the Over MSAL Number is set, the user is shown the date through which the Over MSAL Results entries



**FIGURE 7-1**  
**COMPILE NEW OVER MSALs OPTION**  
**ROUTINE STRUCTURE**

are current and is asked whether a new compile is desired. If the user wants to run the compile, the routine uses the "AJ" cross reference of the Sample Survey file (Date Entered) to review each stressor result entered since the last complete compile date. As the routine begins to process a new date, the date is displayed on the terminal. For each stressor result reviewed, an Over MSAL Results entry is created if the Over Limit at Entry field is 1. All samples are evaluated. When there are employees on file, a separate Over MSAL Results entry is created for each employee in the EMP-X subfile of the Sample Survey Page Number subfile entry that contains an over-limit result. In creating an Over MSAL Results entry, DIE is used to set up the entry, and then the Over Limit Authority field and the Employee, Respirator, Operation, and Sampled/In Area fields are filled in. T2ESOMC increments the Over MSAL Number to make each entry uniquely identifiable. Each time an entry is created for an employee, the routine T2MEXP is invoked to perform MES functions (see the MES Program Maintenance Manual). When the entire Sample Survey file has been reviewed, T2ESOMC updates the fields in the ↑GCNT global.

### 7.2.3 Globals Referenced

The following files are read and/or updated in this option:

<u>File Name</u>	<u>Subfile Name</u>	<u>File Number</u>	<u>Global Reference</u>	<u>Module Owner</u>	<u>Read or Update</u>
Over MSAL Results	---	1137	↑EXP(1137,	EE	Update
Sample Survey	---	1124	↑ESAMP(	EE	Read
Counters	---	1141	↑EXP(1141,	EE	Update
---	---	----	↑GCNT	EE	Update

Other files are documented in the MES Program Maintenance Manual.

### 7.2.4 Variables

- E0: \$Order variable in "AJ" cross reference of the Sample Survey file for the second subscript; corresponds to FileMan format of Date Entered in the Stressors subfile
- E1: \$Order variable in "AJ" cross reference for the third subscript; corresponds to the Sample Survey file entry number
- E2: \$Order variable in "AJ" cross reference for the fourth subscript; corresponds to the Document Number subfile entry number
- E3: \$Order variable in "AJ" cross reference for the fifth subscript; corresponds to the Page Number subfile entry number
- E4: \$Order variable in "AJ" cross reference for the sixth subscript; corresponds to the Stressors subfile entry number



- E6: \$Order variable for the second subscript in "B" cross reference (Over MSAL Number field) to identify previous partial compile entries in the Over MSAL file to be killed by DIK
- ECDA: Internal entry number (DA) for the Counters file
- ECL: Last Over MSAL Number Used
- ECNT: Current Over MSAL number
- ECON: Document Number entry
- EDT: Date of previous complete compile
- EN: \$Order variable for the third subscript in "B" cross reference; Over MSAL file entry number
- ENAM: Current Over MSAL Name (.01 value)
- EP: \$Order variable in the EMP-X subfile
- EPAG: Page Number subfile entry
- EPER: EMP-X subfile entry
- ERES: Stressors subfile entry
- ESUR: Sample Survey file entry number

#### 7.2.5 Remarks

This option supports the printing of exposure notices. Multiples are avoided in the Over MSAL Results file design because the DIWF routine of FileMan does not produce separate reports for each value of a multiple. Therefore, one exposure notice is produced for each stressor result for each employee.

### 7.3 Print Over MSAL List Option

#### 7.3.1 Purpose

The Print Over MSAL List option produces a report showing stressor results that exceeded limits. A line appears on the report for each stressor result for each employee who was "sampled" or "in area".

### 7.3.2 Overview

The routine T2ESR14 produces the Over MSAL List. The sort template OVER MSAL and the print template OVER MSAL are used. DIP is used to perform the printing.

### 7.3.3 Globals Referenced

The following files are read in this option:

<u>File Name</u>	<u>Subfile Name</u>	<u>File Number</u>	<u>Global Reference</u>	<u>Module Owner</u>	<u>Read or Update</u>
Over MSAL Results	---	1137	↑EXP(1137,	EE	Read
Respirators	---	1105	↑EXP(1105,	EE	Read
Location	---	1073	↑AGENCY(1073,	ADMIN	Read
Operation	---	1087	↑DIZ(1087,	ADMIN	Read
Stressor	---	1083	↑STRESS(0,	ADMIN	Read
Sample Units	---	1101	↑EXP(1101,	ADMIN	Read
Agency Unit	---	1074	↑AGENCY(0,	ADMIN	Read
Employee	---	1004	↑EMPLOY(	ADMIN	Read

### 7.3.4 Variables

Only standard FileMan variables are used.

## 7.4 Prepare Over Exposure Notices Option

### 7.4.1 Purpose

The Prepare Over Exposure Notices option prepares exposure notices, identifying the form letter type and print date for any Over MSAL Results file entries for which exposure notices are to be printed. The Print Date field is used as a batching mechanism for grouping letters of a specific type together into a single print run.

### 7.4.2 Overview

T2ENB's process of preparing the exposure notices involves the entry of two fields into a selected Over MSAL file entry. The DIC lookup is screened to find only Over MSAL entries for which an employee is explicitly identified (i.e., no General Area samples). T2GED is used to control the entry of the two fields of data, both of which are required fields. The routine structure is shown in Figure 7-2.

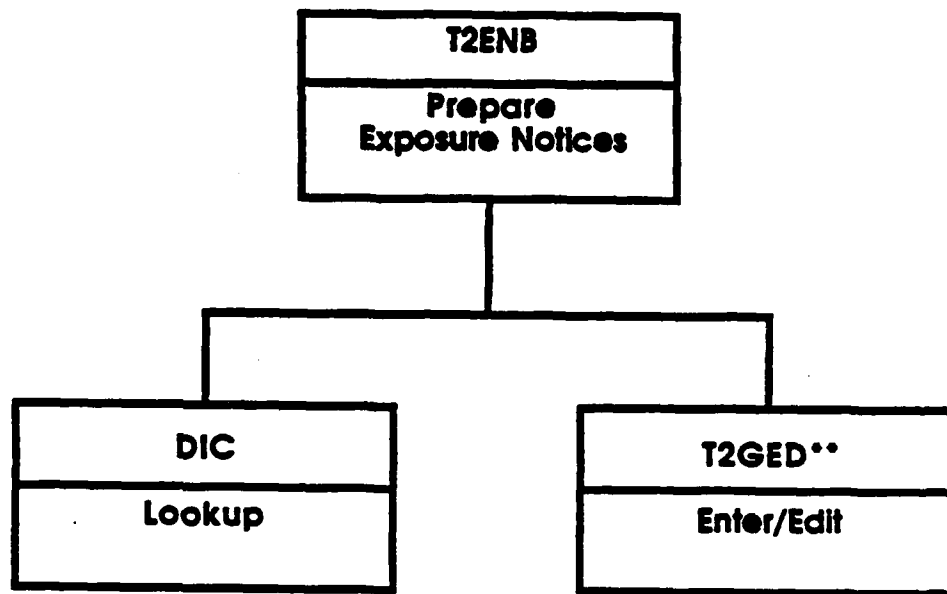


FIGURE 7-2  
PREPARE OVEREXPOSURE NOTICES OPTION  
ROUTINE STRUCTURE

#### 7.4.3 Globals Referenced

The following files are read or updated in this option:

<u>File Name</u>	<u>Subfile Name</u>	<u>File Number</u>	<u>Global Reference</u>	<u>Module Owner</u>	<u>Read or Update</u>
Over MSAL Results	---	1137	↑EXP(1137,	EE	Update
Employee	---	1004	↑EMPLOY(	ADMIN	Read
Stressor	---	1083	↑STRESS(0,	ADMIN	Read

#### 7.4.4 Variables

Only standard FileMan and T2GED variables are used.

#### 7.4.5 Remarks

A DIC("W") field is created to force display of the employee name, stressor name, form letter code, and print date from Over MSAL Results file during lookups.

### 7.5 Annotate Over MSAL Record Option

#### 7.5.1 Purpose

The Annotate Over MSAL Record option records the reason why no exposure notice has been generated from the Over MSAL Results file.

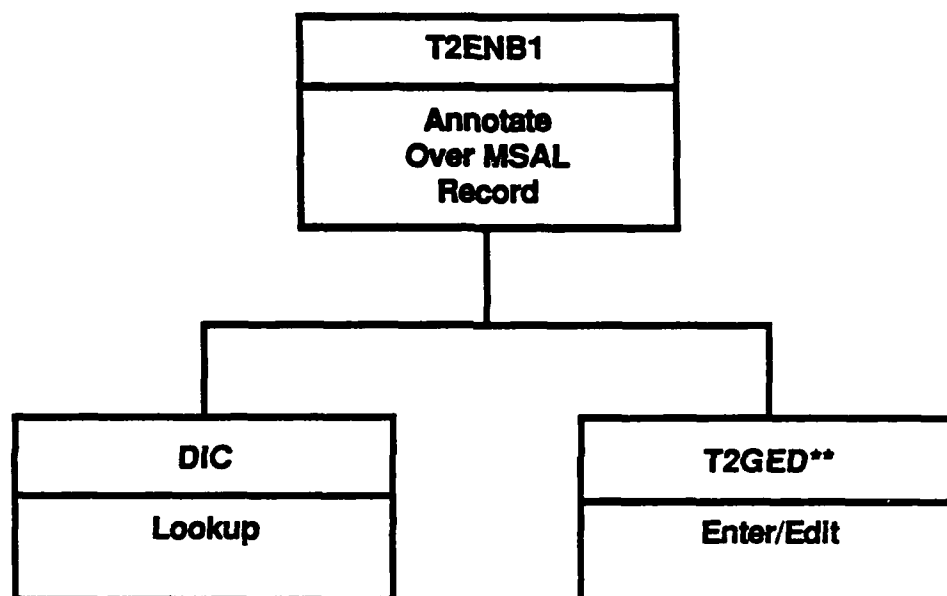
#### 7.5.2 Overview

The routine T2ENB1 performs the Annotate Over MSAL Record option. The DIC lookup is screened to find only Over MSAL Results entries for which an employee is explicitly identified (i.e., no General Area samples). T2GED is used to control the entry of the annotation field. The routine structure is shown in Figure 7-3.

#### 7.5.3 Globals Referenced

The following files are read or updated.

<u>File Name</u>	<u>Subfile Name</u>	<u>File Number</u>	<u>Global Reference</u>	<u>Module Owner</u>	<u>Read or Update</u>
Over MSAL Results	---	1137	↑EXP(1137,	EE	Update
Employee	---	1004	↑EMPLOY(	ADMIN	Read
Stressor	---	1083	↑STRESS(0,	ADMIN	Read



**FIGURE 7-3**  
**ANNOTATE OVER MSAL RECORD OPTION**  
**ROUTINE STRUCTURE**

#### 7.5.4 Variables

Only standard FileMan and T2GED variables are used.

#### 7.5.5 Remarks

A DIC("W") field is created to force display of the employee name, stressor name, form letter code, and print date from Over MSAL Results file during lookups.

#### 7.6 Print Exposure Notices Options

##### 7.6.1 Purpose

The Print Exposure Notices options produce custom form letters embedded with data entered about the sample when results exceeded limits. Two menu options are available for printing these notices: Overexposure Notice Print and Print Exposure Notices by Employee. The difference between the two is in the sort/selection available. A separate letter is generated for each stressor result for each employee who was "sampled" or "in area".

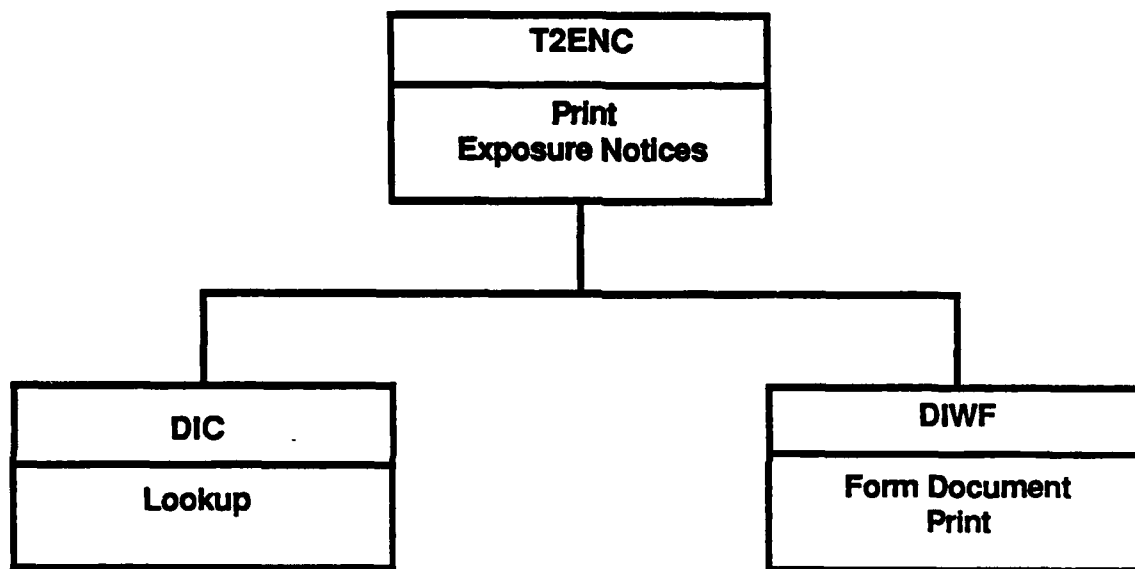
##### 7.6.2 Overview

The routine T2ENC prints exposure notices. The routine structure is shown in Figure 7-4. The standard print option, Overexposure Notice Print, uses the entry point ENT. The sort template EXPOSURE LETTERS is used for this print option. The entry point EN2 is used for the Print Exposure Notices by Employee option. An explicitly set BY field is used when the letters are selected by employee. In either case, DIWF is used to perform the printing.

##### 7.6.3 Globals Referenced

The following files are read or updated in this option:

<u>File Name</u>	<u>Subfile Name</u>	<u>File Number</u>	<u>Global Reference</u>	<u>Module Owner</u>	<u>Read or Update</u>
Exposure Notices	---	1082	↑EXP(1082,	EE	Read
Over MSAL Results	---	1137	↑EXP(1137,	EE	Read
Respirators	---	1105	↑EXP(1105,	EE	Read
Location	---	1073	↑AGENCY(1073,	ADMIN	Read
Operation	---	1087	↑DIZ(1087,	ADMIN	Read
Stressor	---	1083	↑STRESS(0,	ADMIN	Read
Sample Units	---	1101	↑EXP(1101,	ADMIN	Read
Agency Unit	---	1074	↑AGENCY(0,	ADMIN	Read
Employee	---	1004	↑EMPLOY(	ADMIN	Read



**FIGURE 7-4**  
**PRINT EXPOSURE NOTICES OPTION**  
**ROUTINE STRUCTURE**

#### 7.6.4 Variables

The following variable is the only non-standard variable used:

- ELTR: Selected form letter name (.01 value)

#### 7.6.5 Remarks

The creation of form letters is limited to one type of letter at a time. The sort fields are used to limit the range of the Over MSAL Results file entries for which form letters are created. For this reason the FR and TO fields are set with the name of the form letter. The user should specify a range of Print Dates to batch the desired Over MSAL Results file entries for printing.



## 8.0 VENTILATION SURVEY DATA OPTIONS

### 8.1 Introduction to the Ventilation Survey Data Options

Ventilation surveys are conducted to assess the adequacy of ventilation in the facility's work areas. OSHRKS provides the capability of maintaining and reporting data from these surveys through the following set of options.

### 8.2 Ventilation Survey Entry Option

#### 8.2.1 Purpose

The purpose of the Ventilation Survey Entry option is used to enter the data from the Ventilation Survey forms. The data describes the status of each system and source surveyed.

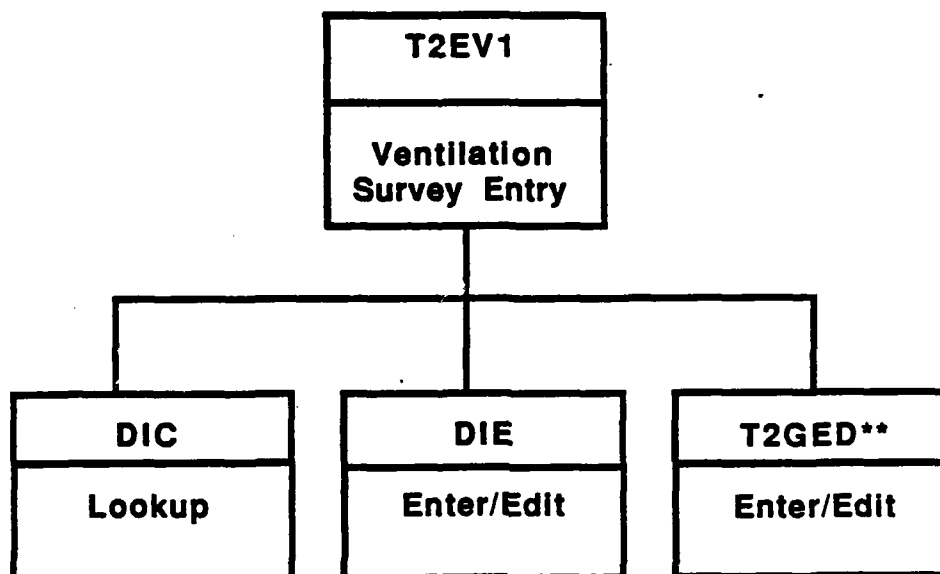
#### 8.2.2 Overview

The routine T2EV1 is invoked to enter ventilation survey data. The routine initially works from the Survey Number file to look up the Survey Number for the ventilation survey. The routine then looks up the Document Number (.01 field) in the Ventilation Survey file, screening the lookup for entries that have the chosen Survey Number pointer in the second piece. (When a new Ventilation Survey file entry is created, DIC("DR") is used to record the chosen Survey Number in the Survey Number field.) T2GED is used to control the data entry of fields from the form until the Measurements data is reached. At this point, DIC is used to identify the Measurement Type for which the user will enter data. Measurement Type is a subfile field. The user will then identify the Measurement Number subfile entry for each of the numbered measurements from the form. After this entry is completed, or if there are no numbered measurements to enter, the routine uses DIE to prompt the user for the three values within the Measurement Type subfile: Velocity Standard, Flow Rate and Units, and Flow Rate Standard. A routine structure diagram is shown in Figure 8-1.

#### 8.2.3 Globals Referenced

The following files are read and/or updated in this option:

<u>File Name</u>	<u>Subfile Name</u>	<u>File Number</u>	<u>Global Reference</u>	<u>Module Owner</u>	<u>Read or Update</u>
Survey Number	---	1146	↑EXP(0,	EE	Update
Ventilation Survey	---	1140	↑EVENT(	EE	Update
Vent System	---	1147	↑EXP(1147,	EE	Update
Vent Source	---	1148	↑EXP(1148,	EE	Update



**FIGURE 8-1**  
**VENTILATION SURVEY ENTRY OPTION**  
**ROUTINE STRUCTURE**

Collection Instrument	---	1086	↑EXP(1086,	EE	Read
Survey Monitor	---	1104	↑EXP(1104,	EE	Update
Agency Unit	---	1074	↑AGENCY(0,	ADMIN	Read
Location	---	1073	↑AGENCY(1073,	ADMIN	Update
Operation	---	1087	↑DIZ(1087,	ADMIN	Read
Employee	---	1004	↑EMPLOY(	ADMIN	Read

#### 8.2.4 Variables

The following variables are used:

- EAG: Pointer value of the Activity/Command field, used to screen the lookup for Shop
- EN: Internal number (DA) of the Ventilation Survey file entry
- EN1: Internal number (DA) of the Measurement Type subfile entry
- EN2: Internal number (DA) of the Measurement Number subfile entry
- ES: Survey ID Number
- EVSYS: Pointer value of the Ventilation System field, used to screen the lookup for Ventilation Source

#### 8.2.5 Remarks

The Survey Number file was created after the programming for the walkthrough and samples data entry was completed; however, at some future time, all survey ID number lookups should use this file, to tie together the various survey data types.

Detailed requirements for this function were very late in arriving, and there are numerous changes that should be made to the design of the file and the data entry sequence. For instance, the Document Number concept does not fit the ventilation survey data since there is already a hierarchy implied by the System and Source fields. The forms need to be changed in tandem with the file design changes; therefore, the appropriate modifications have not yet been made. Before undertaking changes to the Ventilation file design and data entry sequence, additional analysis will be required.

### 8.3 Ventilation Survey Report Functions Option

#### 8.3.1 Purpose

The Ventilation Survey Report Functions option makes data from the Ventilation Survey file available to the user in several standard report formats.

### 8.3.2 Overview

The Ventilation Survey reports are produced by routines that call DIP with the variables defined which specify sort templates and print templates. Table 8-1 shows the routine, sort template, and print template for each of the report options.

### 8.3.3 Globals Referenced

The following files are read in this option:

<u>File</u> <u>Name</u>	<u>Subfile</u> <u>Name</u>	<u>File</u> <u>Number</u>	<u>Global</u> <u>Reference</u>	<u>Module</u> <u>Owner</u>	<u>Read or</u> <u>Update</u>
Survey Number	---	1146	↑EXP(0,	EE	Read
Ventilation Survey	---	1140	↑EVENT(	EE	Read
Vent System	---	1147	↑EXP(1147,	EE	Read
Vent Source	---	1148	↑EXP(1148,	EE	Read
Survey Monitor	---	1104	↑EXP(1104,	EE	Read
Collection Instrument	---	1086	↑EXP(1086,	EE	Read
Agency Unit	---	1074	↑AGENCY(0,	ADMIN	Read
Location	---	1073	↑AGENCY(1073,	ADMIN	Read
Operation	---	1087	↑DIZ(1087,	ADMIN	Read
Employee	---	1004	↑EMPLOY(	ADMIN	Read

### 8.3.4 Variables

Only standard FileMan variables are used in this option.

TABLE 8-1  
VENTILATION SURVEY REPORTS, ROUTINES, AND TEMPLATES

REPORT NAME	ROUTINE	SORT TEMPLATE	PRINT TEMPLATE
Ventilation Survey Reports	T2EVR3	VENT SURVEY	VENT SURVEY
		BY ACT/DATE/SYS/ SRC	VENT SURVEY
		BY ACT/LOC/ INVEST/DATE	VENT SURVEY

## 9.0 MATERIAL INVENTORY SURVEY OPTIONS

### 9.1 Introduction to the Material Inventory Survey Options

Material inventories are conducted periodically to identify what materials are used or stored in specific locations in a facility. Since the data collected in material inventories is similar to the materials data collected during walkthroughs, the material inventories are stored in the Walkthrough file. These entries in the file are identified as material inventory entries by the Type field (set to "M").

### 9.2 Material Inventory Entry Option

#### 9.2.1 Purpose

The Material Inventory Entry option is used to enter the data collected during material inventories conducted in the workplace.

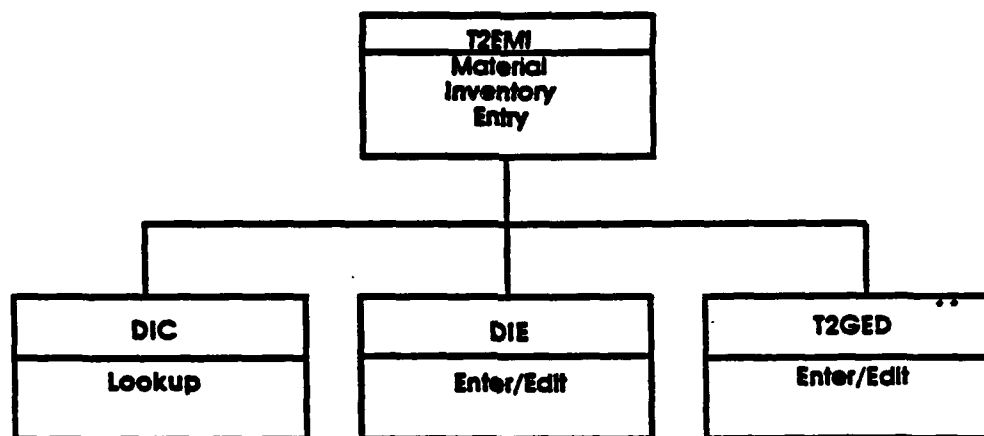
#### 9.2.2 Overview

The routine T2EMI performs the Material Survey Entry option. Material inventory survey data is stored in the Walkthrough file; therefore, lookups for material inventory surveys are screened to find entries only when Type is "M". After identifying the survey, the user is given the option of editing the survey header data, if the survey already exists. If this is a new entry, the routine prompts the user for the survey header fields automatically. Survey header data is entered using T2GED since there are required fields in the data. The value of Location must be entered by the user, but the template will set the value of the Operation multiple as "N/A", since the inventory function focuses on location and not operation. Entries are made into the Materials subfile of the Walkthrough file using DIE. No attempt is made to translate the materials list into a list of stressors as is done in the Walkthrough Data Entry option. The routine structure is shown in Figure 9-1.

#### 9.2.3 Globals Referenced

The following files are read and/or updated in this option:

<u>File Name</u>	<u>Subfile Name</u>	<u>File Number</u>	<u>Global Reference</u>	<u>Module Owner</u>	<u>Read or Update</u>
Walkthrough	---	1085	↑ESURV(	EE	Update
Survey Monitor	---	1104	↑EXP(1104,	EE	Update
Product	---	1142	↑EMAT(	EE	Read
Location	---	1073	↑AGENCY(1073,	ADMIN	Update
Operation	---	1087	↑DIZ(1087,	ADMIN	Read



**FIGURE 9-1**  
**MATERIAL INVENTORY ENTRY OPTION**  
**ROUTINE STRUCTURE**

#### 9.2.4 Variables

The following variables are used:

- ELDA: Internal number (DA) of the Location subfile
- ESDA: Internal number (DA) of the Walkthrough file entry
- ESUR: Survey Number

### 9.3 Material Inventory Report Options

#### 9.3.1 Purpose

The Material Inventory Report options is to provide standard reports of the material inventory data.

#### 9.3.2 Overview

The material inventory reports are performed by routines that call DIP with the variables defined to specify a sort template and a print template. Table 9-1 shows the routine, sort template, and print template for each of the report options.

#### 9.3.3 Globals Referenced

The following files are read in this option:

<u>File Name</u>	<u>Subfile Name</u>	<u>File Number</u>	<u>Global Reference</u>	<u>Module Owner</u>	<u>Read or Update</u>
Walkthrough	---	1085	↑ESURV(	EE	Read
Survey Monitor	---	1104	↑EXP(1104,	EE	Read
Product	---	1142	↑EMAT(	EE	Read
Location	---	1073	↑AGENCY(1073,	ADMIN	Read
Operation	---	1087	↑DIZ(1087,	ADMIN	Read

#### 9.3.4 Variables

Only standard FileMan variables are used.



TABLE 9-1  
MATERIAL INVENTORY REPORTS, ROUTINES, AND TEMPLATES

REPORT NAME	ROUTINE	SORT TEMPLATE	PRINT TEMPLATE
Material Inventory Report (by Location)	T2EMR2	MAT INV-LOC	MAT INV
Material Inventory Report (by Survey Number)	T2EMR1	MAT INV	MAT INV
Material Location List	T2EMR3	MAT LOC2	MAT LOC2

## 10.0 SURVEY ACTIONS DATA OPTIONS

### 10.1 Introduction to the Survey Actions Data Options

Survey actions are notes that the IH wishes to make to himself or herself about any follow-up activity to be performed. These notes may either accompany a walkthrough survey, sampling survey, ventilation survey, or be made without relationship to a survey. Survey action data is stored in the Survey Action file.

### 10.2 Survey Action Entry Option

#### 10.2.1 Purpose

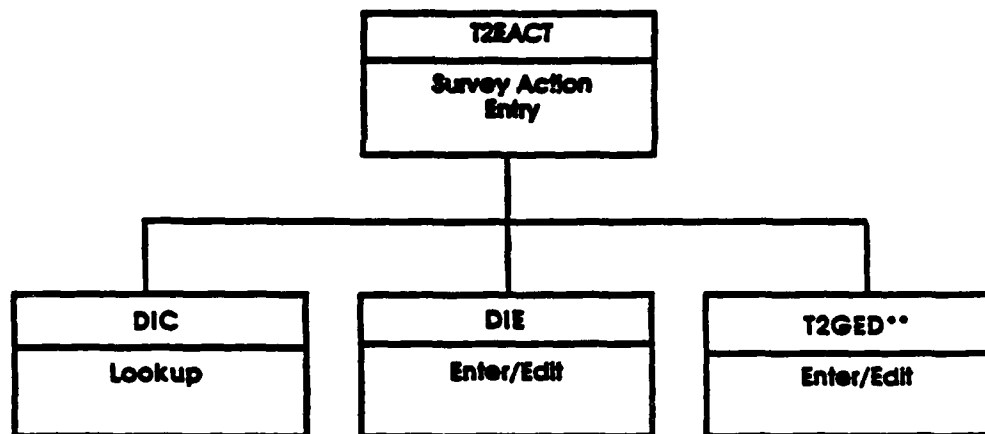
The Survey Action Entry option is used to enter or edit a survey action on file. A special case occurs when the entry is invoked from the Enter/Edit Sample Survey option or the Walkthrough Survey Entry option.

#### 10.2.2 Overview

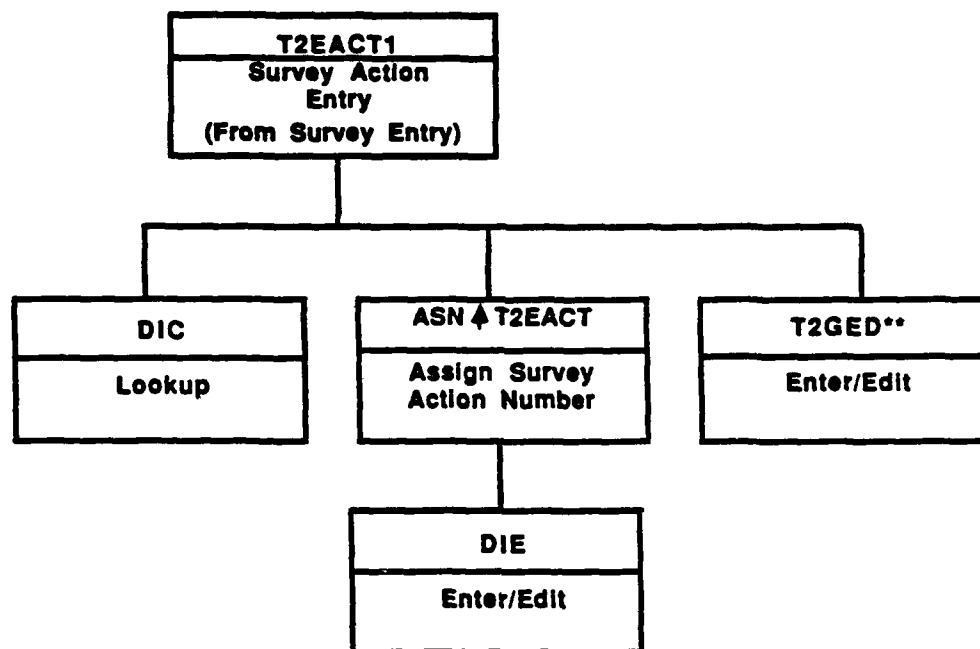
The routine T2EACT is used for the Survey Action Entry option. The routine prompts the user for the Survey Action ID Number, expecting the entry of "NEW" when the user wishes to create a new survey action. The DIC lookup is screened to find only survey actions that are in a "pending" status. The input template SURVEY ACTION is used. T2GED is called to drive the entry process.

At the end of the entry sequence for a new survey action, the paragraph ASN is used to assign a new Survey Action ID Number and to file it in the newly created entry. The global ↑CON("ESACT", is used to control the assignment of ID numbers to survey actions, and it is updated to reflect the new number that was assigned. The routine structure is shown in Figure 10-1.

If the survey action entry is called from the Walkthrough Data Entry option or the Enter/Edit Sample Survey option, the routine T2EACT1 is used. This routine uses the input template SURVEY ACT2. The major difference between this template and the SURVEY ACTION template is that when survey actions are entered as part of another entry sequence, many of the data fields' values are known and are entered by the template into the file entry, whereas, in the normal process, the user is prompted for each field. As in the normal entry, "NEW" is used to indicate a new entry and ASN of T2EACT is used both to assign the new ID number and to update the ↑CON("ESACT" global. The routine structure is shown in Figure 10-2.



**FIGURE 10-1**  
**SURVEY ACTION ENTRY OPTION**  
**ROUTINE STRUCTURE**



**FIGURE 10-2**  
**SURVEY ACTION ENTRY**  
**(WHEN INVOKED FROM ENTRY OF A SURVEY)**  
**ROUTINE STRUCTURE**

### 10.2.3 Globals Referenced

The following files are read and/or updated in this option:

<u>File Name</u>	<u>Subfile Name</u>	<u>File Number</u>	<u>Global Reference</u>	<u>Module Owner</u>	<u>Read or Update</u>
Control	---	---	↑CON("ESACT",	EE	Update
Survey Action	---	1107	↑EXP(1107,	EE	Update
Survey Monitor	---	1104	↑EXP(1104,	EE	Read
Agency Unit	---	1074	↑AGENCY(0,	ADMIN	Read
Location	---	1073	↑AGENCY(1073,	ADMIN	Update
Operation	---	1087	↑DIZ(1087,	ADMIN	Read

### 10.2.4 Variables

The following variables are used:

- EFY: 2-digit year of creation date of the survey action
- ENEW: Flag for new entry (in T2EACT1)
- ESN: Newly-assigned ID number

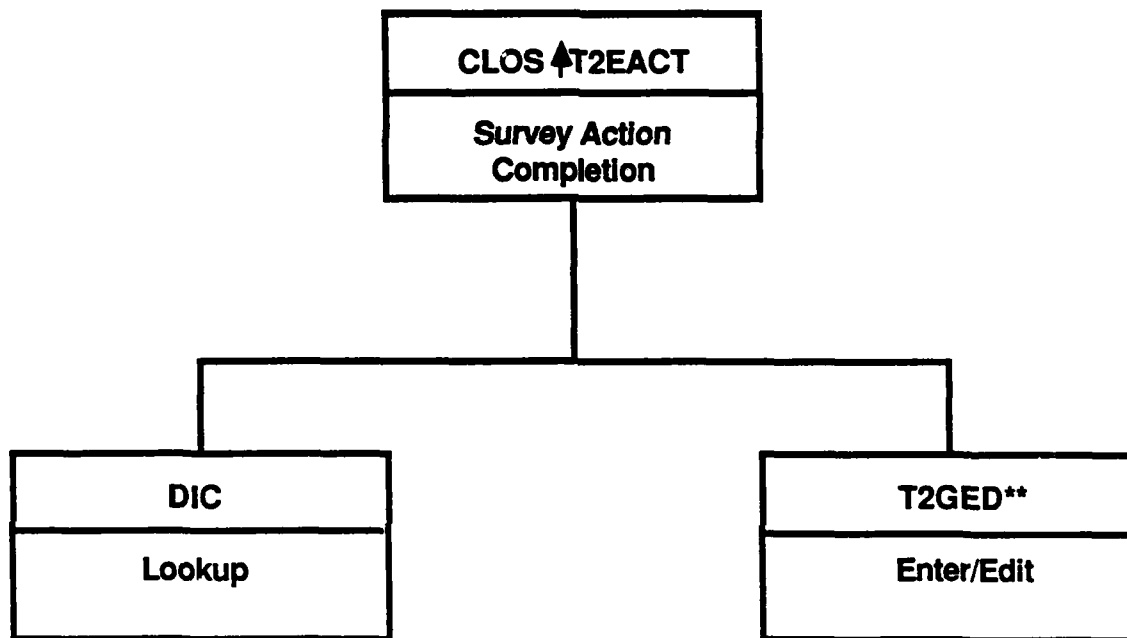
## 10.3 Survey Action Completion Option

### 10.3.1 Purpose

The Survey Action Completion option is used to mark an entry in the Survey Action file as "completed", so that it will not appear on future reports of outstanding survey actions.

### 10.3.2 Overview

The entry point CLOS of routine T2EACT performs the Survey Action Completion option. This routine is a very simple entry of the Completion Date, and the Status field is automatically set with the new value of "C" for completed. DIC and T2GED routines are used. The routine structure is shown in Figure 10-3.



**FIGURE 10-3**  
**SURVEY ACTION COMPLETION OPTION**  
**ROUTINE STRUCTURE**

### 10.3.3 Globals Referenced

The following file is updated in this option:

<u>File Name</u>	<u>Subfile Name</u>	<u>File Number</u>	<u>Global Reference</u>	<u>Module Owner</u>	<u>Read or Update</u>
Survey Action	---	1107	↑EXP(1107,	EE	Update

### 10.3.4 Variables

Only Standard FileMan and T2GED variables are used.

## 10.4 Survey Action Report Options

### 10.4.1 Purpose

The Survey Action Report options provide standard reports of survey action data on file.

### 10.4.2 Overview

The Survey Action reports are produced by routines that call the AIP with the variables defined which specify sort templates and print templates. Table 10-1 shows the routine, sort template, and print template for each of the report options.

### 10.4.3 Globals Referenced

The following files are read in this option:

<u>File Name</u>	<u>Subfile Name</u>	<u>File Number</u>	<u>Global Reference</u>	<u>Module Owner</u>	<u>Read or Update</u>
Survey Action	---	1107	↑EXP(1107,	EE	Read
Survey Monitor	---	1104	↑EXP(1104,	EE	Read
Agency Unit	---	1074	↑AGENCY(0,	ADMIN	Read
Location	---	1073	↑AGENCY(1073,	ADMIN	Read
Operation	---	1087	↑DIZ(1087,	ADMIN	Read

### 10.4.4 Variables

Only standard FileMan variables are used.

TABLE 10-1  
SURVEY ACTIONS REPORTS, ROUTINES, AND TEMPLATES

REPORT NAME	ROUTINE	SORT TEMPLATE	PRINT TEMPLATE
Survey Action Report	T2EACR1	SURVEY ACTION	SURVEY ACTION
Overdue Survey Actions Report	T2EACR2	OVERDUE ACTION	SURVEY ACTION



## 11.0 SAMPLE TRACKING OPTIONS

### 11.1 Introduction to the Sample Tracking Options

Sample Tracking options use the Lab Tracking file to maintain a record of when samples were sent out of a facility and when the results of those samples are due to be returned. The file supports the printing of reports that show outstanding samples and samples that are overdue.

### 11.2 Send Out Samples Option

#### 11.2.1 Purpose

The Send Out Samples option creates an entry in the Lab Tracking file indicating what sample has been sent, where it has been sent, and when the results are expected for the sample.

#### 11.2.2 Overview

The routine T2EL1 performs the Send Out Samples option. This routine uses the input template OUTSPEC to enter data into the Lab Tracking file. T2GED is used to control the data entry process. The routine structure is shown in Figure 11-1.

#### 11.2.3 Globals Referenced

The following files are updated in this option:

<u>File Name</u>	<u>Subfile Name</u>	<u>File Number</u>	<u>Global Reference</u>	<u>Module Owner</u>	<u>Read or Update</u>
Lab Tracking	---	1130	↑EXP(1130,	EE	Update
Laboratories (Outside)	---	1131	↑EXP(1131,	EE	Update

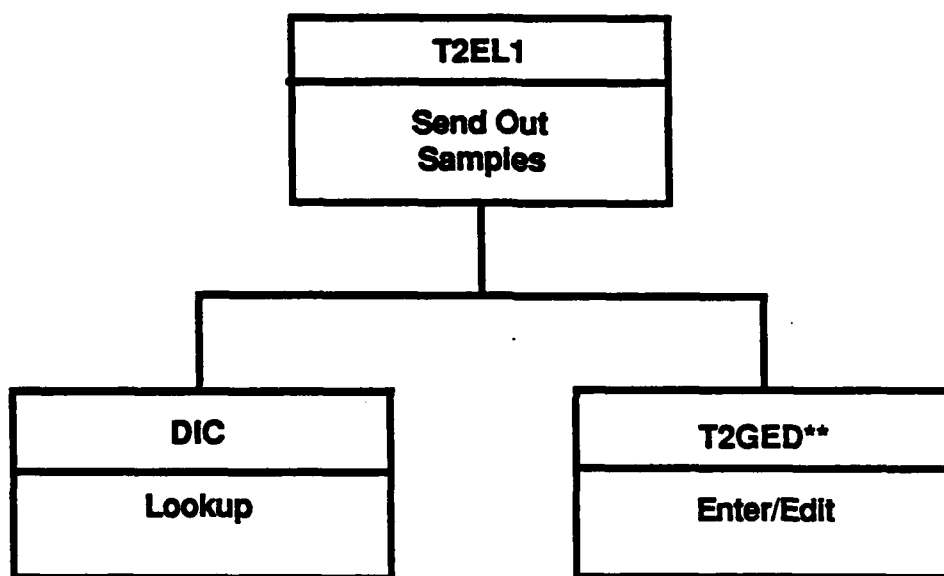
#### 11.2.4 Variables

Only standard FileMan and T2GED variables are used.

### 11.3 Receive Samples Option

#### 11.3.1 Purpose

The Receive Samples option is used to mark an entry in the Lab Tracking file as received, so that it will not appear as outstanding or overdue on subsequent reports.



**FIGURE 11-1  
SEND OUT SAMPLES OPTION  
ROUTINE STRUCTURE**

### 11.3.2 Overview

The routine T2EL2 performs the Receive Samples option. This routine uses the input template RECEIPT to update the Lab Tracking file. The routine DIE is used to drive the input process. The routine structure is shown in Figure 11-2.

### 11.3.3 Globals Referenced

The file that is updated is described below.

<u>File Name</u>	<u>Subfile Name</u>	<u>File Number</u>	<u>Global Reference</u>	<u>Module Owner</u>	<u>Read or Update</u>
Lab Tracking	---	1130	↑EXP(1130,	EE	Update

### 11.3.4 Variables

Only standard FileMan variables are used.

## 11.4 Sample Tracking Report Options

### 11.4.1 Purpose

The Sample Tracking Report options produce standard reports that show the user which samples are outstanding (not yet returned) and which are overdue (past the Date Sample Results Expected).

### 11.4.2 Overview

The Sample Tracking reports are produced by routines that call DIP with the variables defined which specify sort templates and print templates. Table 11-1 shows the routine, sort template, and print template for each of the report options.

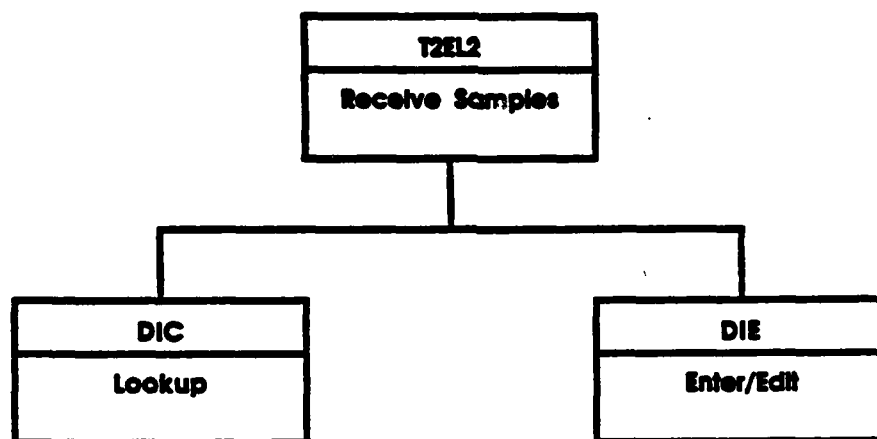
### 11.4.3 Globals Referenced

The files that are read and updated are described below.

<u>File Name</u>	<u>Subfile Name</u>	<u>File Number</u>	<u>Global Reference</u>	<u>Module Owner</u>	<u>Read or Update</u>
Lab Tracking	---	1130	↑EXP(1130,	EE	Read
Laboratories (Outside)	---	1131	↑EXP(1131,	EE	Read

### 11.4.4 Variables

Only standard FileMan variables are used.



**FIGURE 11-2  
RECEIVE SAMPLES OPTION  
ROUTINE STRUCTURE**

TABLE 11-1  
SAMPLE TRACKING REPORTS, ROUTINES, AND TEMPLATES

REPORT NAME	ROUTINE	SORT TEMPLATE	PRINT TEMPLATE
Overdue Samples Report	T2EL3	OVERDUE	OVERDUE
Outstanding Samples Report	ALL ↑T2EL3	OUTSTANDING	OVERDUE

## 12.0 MONITORING PLANNING SUPPORT OPTIONS

### 12.1 Introduction to the Monitoring Planning Support Options

The options which support the planning of monitoring activities assist IH managers in planning walkthroughs and samples collection. These options use the Walkthrough file as the record of when the most recent walkthrough of a workplace was conducted. To assist the IH professional in deciding how frequently to repeat the walkthrough inspection of a workplace, the Exposure Risk report can be produced. This report shows the data collected during a walkthrough that is specifically related to the risk of exposure, e.g., Exposure Risk, Need to Sample, Number of Persons. Using a file of established walkthrough frequencies (the Monitoring Planning file), the EE module provides reports showing which areas are due or overdue to be inspected. Using the data in the Sampling Goals file, the EE module counts the number of samples on file in the Sample Survey file to provide the Sampling Progress Report.

### 12.2 Exposure Risk Report Option

#### 12.2.1 Purpose

The Exposure Risk Report option provides a report for the IH which shows the risk-related data as entered from a walkthrough survey. The report may be organized by specific location, or operation, or location/operation.

#### 12.2.2 Overview

The routine T2ESR4 produces the Exposure Risk Report. Before printing the report, the user is given the option of sequencing the report by location or by operation. Once the choice is made, DIP is used to perform the printing. The sort template and print template used differ based on the sequence desired; W BY LOC/OP/DT is used with RISK BY LOC, and W BY OP/LOC/DT is used with RISK BY OP2.

#### 12.2.3 Globals Referenced

The following files are read and/or updated in this option:

<u>File Name</u>	<u>Subfile Name</u>	<u>File Number</u>	<u>Global Reference</u>	<u>Module Owner</u>	<u>Read or Update</u>
Walkthrough	---	1085	↑ESURV(	EE	Read
Frequency of Ops	---	1106	↑EXP(1106,	EE	Read
Location	---	1073	↑AGENCY(1073,	ADMIN	Update
Operation	---	1087	↑DIZ(1087,	ADMIN	Read

#### 12.2.4 Variables

Only standard FileMan variables are used.

#### 12.3 Walkthrough Frequency Entry Option

##### 12.3.1 Purpose

The Walkthrough Frequency Entry option is used to enter the specific frequency (in months) for which a walkthrough survey should be conducted in each location/operation. If the user does not enter a specific frequency, the EE module assumes a 12-month frequency entry in conformance with Navy policy guidelines.

##### 12.3.2 Overview

The routine T2ESMON performs the Walkthrough Frequency Entry option. This routine maintains data in the Monitoring Planning file. The first activity of the routine is to ask what identifier the user wishes to use in selecting the entries for which he or she wishes to enter a walkthrough frequency. The user may choose to enter data in this option by Survey Number, Location, or Operation. Once the user has chosen to enter data by Survey Number, Location, or Operation, he is asked to choose a specific value of that field for which the entries in the Monitoring Plan file are to be selected. The routine uses DIC to determine the matches to the selected data. By using a "Y" in the DIC(0) string, the lookup creates a Y array of the entry numbers which are found during the lookup. T2ESMON then makes a new array EY to hold the entry numbers. The paragraph LP loops through all the entries of the EY array and invokes DIE to allow the user to enter the Survey Every n Months field. The routine structure is shown in Figure 12-1.

##### 12.3.3 Globals Referenced

The following files are read and/or updated in this option:

<u>File Name</u>	<u>Subfile Name</u>	<u>File Number</u>	<u>Global Reference</u>	<u>Module Owner</u>	<u>Read or Update</u>
Monitoring Plan	---	1114	↑EXP(1114,	EE	Update
Location	---	1073	↑AGENCY(1073,	ADMIN	Read
Operation	---	1087	↑DIZ(1087,	ADMIN	Read

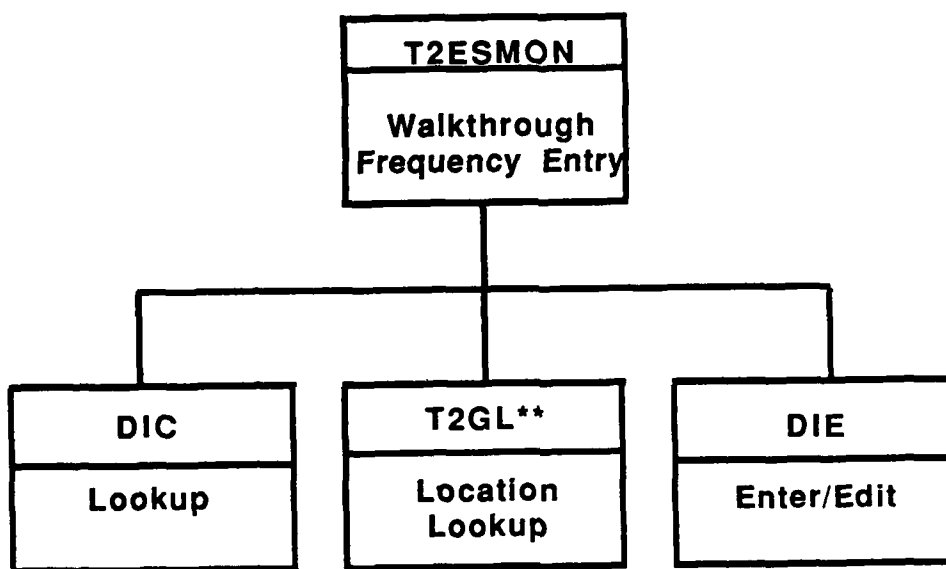


FIGURE 12-1  
WALKTHROUGH FREQUENCY ENTRY OPTION  
ROUTINE STRUCTURE



#### 12.3.4 Variables

The following variables are used:

- EI: Index variable used in the "for" loop in paragraph LP
- ELOC: Location pointer in Monitoring Plan file entry
- EOP: Operation file string
- EX: Previously-entered value for the Survey Every n Months field
- EY array: Subscripted by the entry numbers of the matches to the lookup in the Monitoring Plan file for the selected Survey Number, Location, or Operation
- EY0: The Monitoring Plan entry string

#### 12.4 Enter Sampling Goals

##### 12.4.1 Purpose

The Enter Sampling Goals option is used to define a number of samples that should be collected, annually and overall, in some specified location and/or operation.

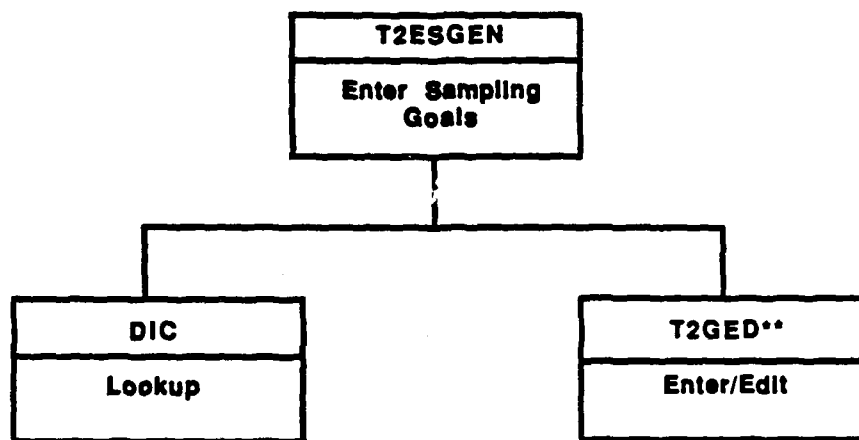
##### 12.4.2 Overview

The routine T2ESGEN performs the Enter Sampling Goals option. The routine enters data into the Samp Progress file using the input template SAMP GOALS. T2GED is used to drive the data entry process. The routine structure is shown in Figure 12-2.

##### 12.4.3 Globals Referenced

The following files are read and/or updated in this option:

<u>File Name</u>	<u>Subfile Name</u>	<u>File Number</u>	<u>Global Reference</u>	<u>Module Owner</u>	<u>Read or Update</u>
Samp Progress	---	1121	↑EXP(1121,	EE	Update
Location	---	1073	↑AGENCY(1073,	ADMIN	Update
Operation	---	1087	↑DIZ(1087,	ADMIN	Read
Stressor	---	1083	↑STRESS(0,	ADMIN	Read



**FIGURE 12-2  
ENTER SAMPLING GOALS OPTION  
ROUTINE STRUCTURE**

#### 12.4.4 Variables

Only standard FileMan and T2GED variables are used.

### 12.5 Sampling Progress Report Option

#### 12.5.1 Purpose

The Sampling Progress Report option produces a report which shows the goals established for the number of samples to be collected and the rate of completion of those goals.

#### 12.5.2 Overview

The routine T2ESR6 produces the Sampling Progress Report. The user is asked first if he or she wishes to select the contents of the report; the entry point EN2 is used if selection is desired. DIP is used to perform the printing. The sort template GOALS BY LOC/OP/STR and the print template GOALS LIST1 are used for both the selectable and the full report.

#### 12.5.3 Globals Referenced

The following files are read in this option:

<u>File Name</u>	<u>Subfile Name</u>	<u>File Number</u>	<u>Global Reference</u>	<u>Module Owner</u>	<u>Read or Update</u>
Sample Progress	---	1121	↑EXP(1121,	EE	Read
Location	---	1073	↑AGENCY(1073,	ADMIN	Read
Operation	---	1087	↑DIZ(1087,	ADMIN	Read
Stressor	---	1083	↑STRESS(0,	ADMIN	Read

#### 12.5.4 Variables

The following variables are used in the computation of Location Count for given year:

- EI: Index variable in Location
- EY: \$Order variable for loop through Date Sampled subfile
- EYR: Year (first 3 digits of FileMan date format)

#### 12.5.5 Remarks

The update of the Count field in the Sample Progress file is triggered automatically by the Result Type field in the Sample Survey

file. The counts shown on the Sampling Progress Report are dependent on the accuracy of this field. (The triggered action is done by the routine T2ESPG; there are sections both to add to the count and to subtract from the count based on entry or deletion respectively of a result type "TWA" in the Sample Survey file.)

The Computed fields are the basic fields used to produce this report. The computations are described below:

- Count in Location--Total of all Count fields in Date Sampled subfile
- Location Count for a Given Year--Sum of all Count fields in Date Sampled subfile for Dates that are in selected year
- Operation Count--Total of Count in Location from Location subfile
- Operation Count for a Given Year--Total of Location Count for given year in Location subfile
- Stressor Count--Total of Operation Count in Operation subfile
- Stressor Count for a Given Year--Total of Operation Count for given year in Operation subfile

## 12.6 Walkthroughs Due and Overdue Reports Options

### 12.6.1 Purpose

The Walkthroughs Due Report and the Walkthroughs Overdue Report options produce reports that show the areas and operations that should be surveyed according to the established frequency of survey (Survey Every n Months field in the Monitoring Plan file).

### 12.6.2 Overview

The routine T2ESMR1 produces the reports. The routine structure diagram is shown in Figure 12-3. The walkthroughs due are printed at the entry point DUE; overdues are printed at entry point OVER. The first activity of the report process in each case is to determine whether the user wishes to recalculate which were the last surveys conducted in each of the location/operations in the file. The routine T2ESMCO is used to review the data in the Walkthrough file and to fill the fields of the Monitoring Plan file that refer to the most recent survey. Once the Monitoring Plan file has been updated with the most recent data, the report is produced by DIP, using sort template MON PLAN LIST2 and print template MON PLAN LIST.

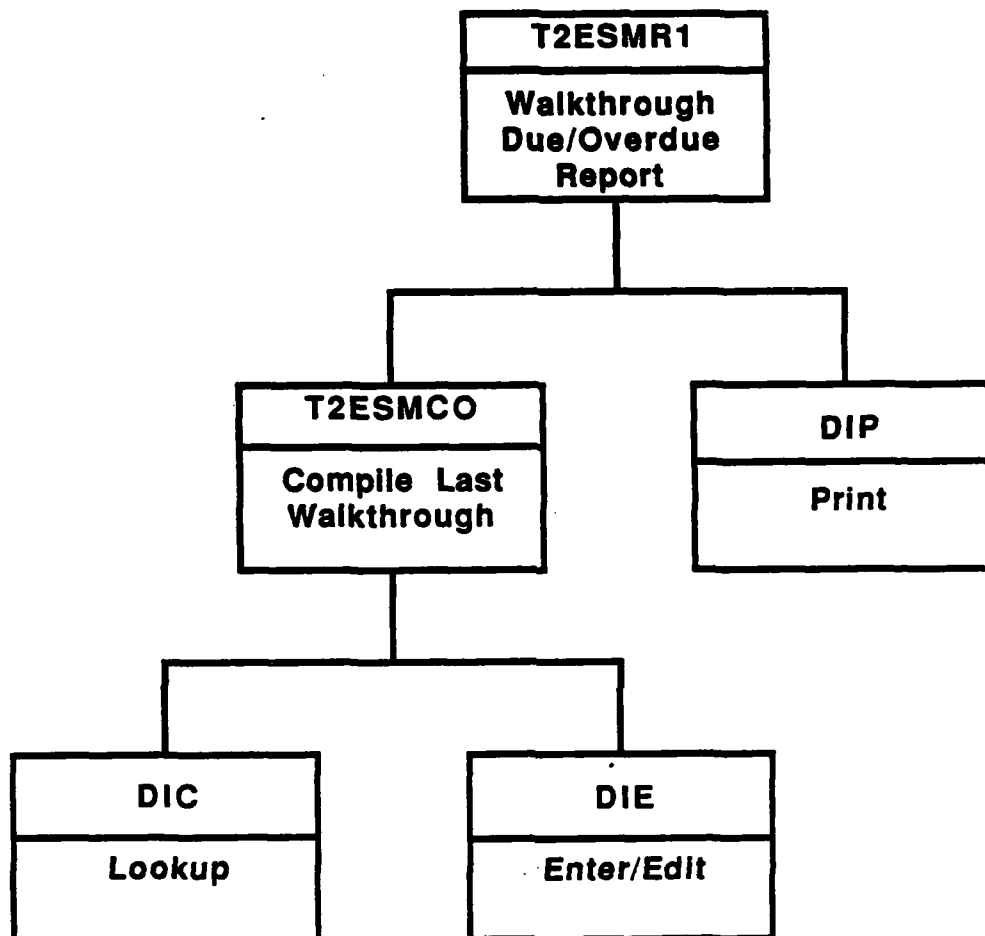


FIGURE 12-3  
WALKTHROUGH DUE AND OVERDUE REPORT OPTIONS  
ROUTINE STRUCTURE

T2EMCO \$Orders through the Walkthrough file and puts data into the Monitoring Plan file if the date of the Walkthrough is after the Date Last Survey or there is no Date Field in the Monitoring Plan entry. The routine uses DIC, with a screen on Operation, to look up the appropriate Monitoring Plan entry. The DIC("DR") variable causes any new Monitoring Plan entry to have the Operation field set at the time of creation by DIC. DIE is used with the input template MON REPORT to file the data.

### 12.6.3 Globals Referenced

The following files are read and/or updated in this option:

<u>File Name</u>	<u>Subfile Name</u>	<u>File Number</u>	<u>Global Reference</u>	<u>Module Owner</u>	<u>Read or Update</u>
Monitoring Plan	---	1114	↑EXP(1114,	EE	Update
Survey Monitor	---	1104	↑EXP(1104,	EE	Read
Frequency of Ops	---	1106	↑EXP(1106,	EE	Read
Location	---	1073	↑AGENCY(1073,	ADMIN	Read
Operation	---	1087	↑DIZ(1087,	ADMIN	Read
Agency Unit	---	1074	↑AGENCY(0,	ADMIN	Read

### 12.6.4 Variables

Only standard FileMan variables are used in T2ESMR1. In T2ESMCO the following variables are used:

- EACT: Investigator pointer
- EDO: \$Order variable for top level of the Walkthrough file
- ED1: \$Order variable for Location subfile of the Walkthrough file
- ED2: \$Order variable for Operation subfile of the Walkthrough file
- EDUR: Duration of Operation in Walkthrough file
- EFRE: Frequency of Operation pointer in Walkthrough file
- EFROM: From Date in FileMan date format
- ELOC: Location pointer
- ENUM: Value of Number of Persons in Walkthrough file

- EO: Temporary holding variable for strings read from Walkthrough file
- EOP: Operation pointer in Walkthrough file
- EOS: Data string from top level of Walkthrough file
- ESHOP: Shop pointer in Walkthrough file
- ESUR: Survey/Boundary Number

### 13.0 EQUIPMENT DATA OPTIONS

#### 13.1 Introduction to the Equipment Data Options

The Equipment Data options create and report data from the Collection Instrument file. The data describes each collection instrument and, optionally, the calibration history of the instrument. This file is used within the EE module to control the vocabulary used for collection instruments used during surveys of the workplace.

#### 13.2 Enter/Edit Collection Instrument Option

##### 13.2.1 Purpose

The Enter/Edit Collection Instrument option is used to create or modify an entry in the Collection Instrument file.

##### 13.2.2 Overview

The routine T2EQEN is invoked for the Enter/Edit Collection Instrument option. The routine structure diagram is shown in Figure 13-1. This routine uses DIC to lookup or create an entry in the file. Then T2GED is used with the input template EQUIP ADD to create a new entry or the input template EQUIP EDIT to edit an existing entry.

##### 13.2.3 Globals Referenced

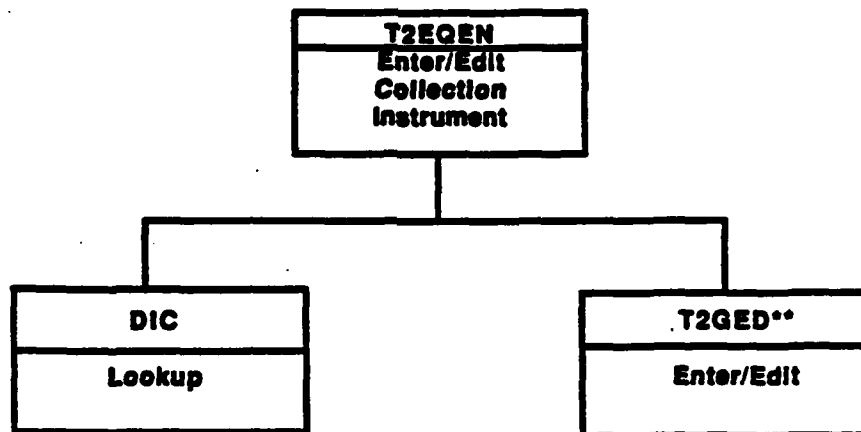
The following files are updated in this option:

<u>File Name</u>	<u>Subfile Name</u>	<u>File Number</u>	<u>Global Reference</u>	<u>Module Owner</u>	<u>Read or Update</u>
Collection Instrument	---	1086	↑EXP(1086,	EE	Update
Collection Instrument	---	1094	↑EXP(1094,	EE	Update
Type					
Calibration	---	1095	↑EXP(1095,	EE	Update
Agency					
Equipment Storage	---	1096	↑EXP(1096,	EE	Update
Location					

##### 13.2.4 Variables

Only standard FileMan and T2GED variables are used.





**FIGURE 13-1**  
**ENTER/EDIT COLLECTION INSTRUMENT OPTION**  
**ROUTINE STRUCTURE**

### 13.3 Inactivate an Existing Instrument Option

#### 13.3.1 Purpose

The Inactivate an Existing Instrument option is used to logically delete a collection instrument from the file.

#### 13.3.2 Overview

The routine T2EQD, invoked to Inactivate an Existing Instrument, uses DIC to lookup the entry to be inactivated, DIQ to display the descriptive information on file about the selected entry, and DIE to query the user for the Date Inactivated. The routine structure is shown in Figure 13-2.

#### 13.3.3 Globals Referenced

The following file is updated in this option:

<u>File</u> <u>Name</u>	<u>Subfile</u> <u>Name</u>	<u>File</u> <u>Number</u>	<u>Global</u> <u>Reference</u>	<u>Module</u> <u>Owner</u>	<u>Read or</u> <u>Update</u>
Collection Instrument	---	1086	↑EXP(1086,	EE	Update

#### 13.3.4 Variables

Only standard FileMan variables are used.

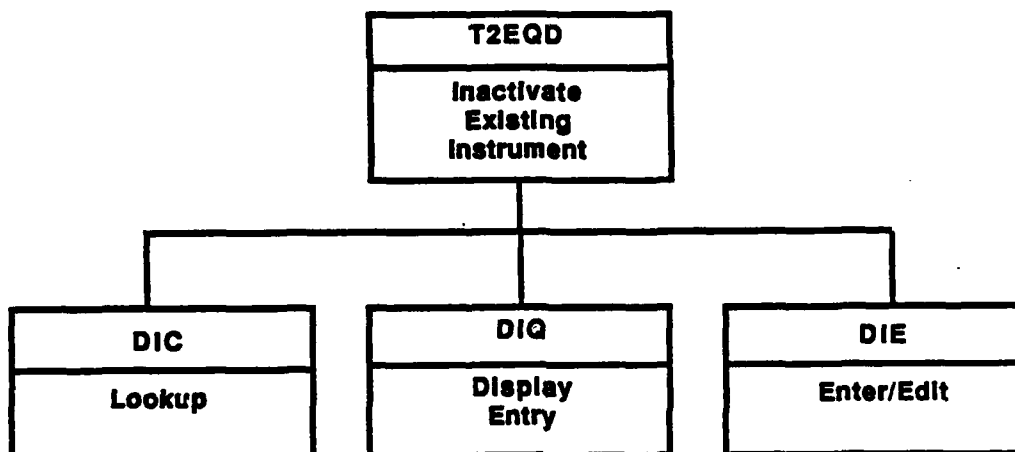
### 13.4 Send Out Instrument for Calibration Option

#### 13.4.1 Purpose

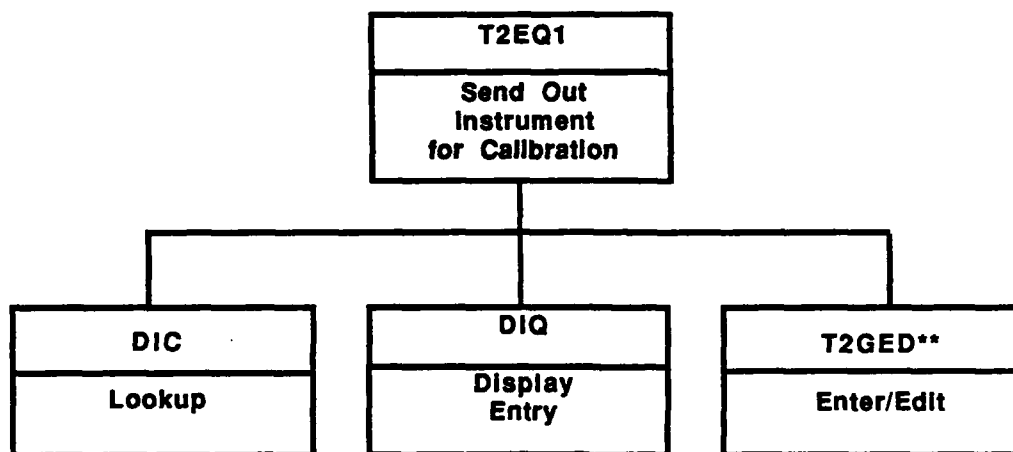
The Send Out Instrument for Calibration option is used to record that an instrument has been sent out of the local facility to be calibrated.

#### 13.4.2 Overview

The routine T2EQ1 is invoked for the Send Out Instrument for Calibration option. The routine uses DIC to lookup the entry in the Collection Instrument file. It then uses DIQ to display the descriptive information about the selected entry to the user. Variables are set to provide default values for the send out transaction prompts, based on the fields that describe the "usual" calibration for the instrument. Then T2GED is used to prompt the user for the send out fields. The routine structure diagram is shown in Figure 13-3.



**FIGURE 13-2**  
**INACTIVATE AN EXISTING INSTRUMENT OPTION**  
**ROUTINE STRUCTURE**



**FIGURE 13-3**  
**SEND OUT INSTRUMENT FOR CALIBRATION OPTION**  
**ROUTINE STRUCTURE**

### 13.4.3 Globals Referenced

The following files are read and/or updated in this option:

<u>File Name</u>	<u>Subfile Name</u>	<u>File Number</u>	<u>Global Reference</u>	<u>Module Owner</u>	<u>Read or Update</u>
Collection Instrument	---	1086	↑EXP(1086,	EE	Update
Calibration Agency	---	1095	↑EXP(1095,	EE	Read

### 13.4.4 Variables

The following variables are used:

- ECAG: Usual Calibration Agency name
- EQA: Zero node string of the Collection Instrument file entry

### 13.5 Record/Edit Calibration for Instrument Option

#### 13.5.1 Purpose

The Record/Edit Calibration for Instrument option is used to enter the data describing the calibration history of a selected collection instrument.

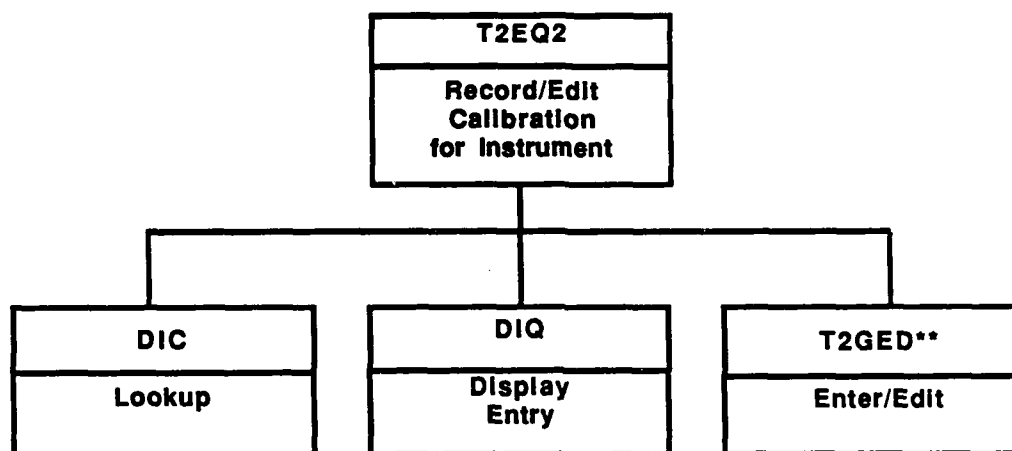
#### 13.5.2 Overview

The routine T2EQ2 is invoked for the Record/Edit Calibration for Instrument option. The routine uses DIC for lookup of the desired collection instrument entry. Then, if the instrument was recently sent out, DIQ is used to display the information on file describing when the instrument was sent. DIC is used again to select or add an entry in the Calibration Date subfile. T2GED is used to prompt the user for the Calibration subfile data. The MUMPS "SET" command is used to "null out" the data describing when the instrument was sent out. Then T2GED is used to prompt the user through the fields that describe the "usual" calibration of the instrument. The routine structure diagram is shown in Figure 13-4.

### 13.5.3 Globals Referenced

The following files are read and/or updated in this option:

<u>File Name</u>	<u>Subfile Name</u>	<u>File Number</u>	<u>Global Reference</u>	<u>Module Owner</u>	<u>Read or Update</u>
Collection Instrument	---	1086	↑EXP(1086,	EE	Update
Calibration Agency	---	1095	↑EXP(1095,	EE	Read



**FIGURE 13-4**  
**RECORD/EDIT CALIBRATION FOR INSTRUMENT OPTION**  
**ROUTINE STRUCTURE**

#### 13.5.4 Variables

The following variables are used:

- ECAG: Pointer to the Calibration Agency file, default value
- ED0: Internal number (DA) of the Collection Instrument file entry
- ED1: Internal number (DA) of the Calibration Date subfile
- EDT: Calibration Date in FileMan format
- EQA: String describing the data recorded when the instrument was sent out, stored in node 1
- EXX: Zero node data from the entry

#### 13.5.5 Remarks

There is a consistency check on the Calibration Date field, to determine that it is after the Date Sent (if there was a Date Sent on file) and is more recent than the most recent Calibration Date on file. This check is done in the routine T2EQ2 at the entry point CHK and is invoked from the input syntax check on the Calibration Date field.

#### 13.6 Collection Instrument Report Options

##### 13.6.1 Purpose

The Collection Instrument Report options provide reports from the data in the Collection Instrument file.

##### 13.6.2 Overview

Two of the Collection Instrument reports are produced by routines that call the FileMan print routine DIP with the variables defined which specify sort templates and print templates. The remaining report, the Inquire on Collection Instrument, is the only option in the EE module that is an "Inquire" type option rather than a "Run Routine" option. Table 13-1 shows the routine, sort template, and print template for each of the report options.

TABLE 13-1  
COLLECTION INSTRUMENT REPORTS, ROUTINES, AND TEMPLATES

REPORT NAME	ROUTINE	SORT TEMPLATE	PRINT TEMPLATE
List Equipment Inventory	T2EQR2	EQUIP LIST 1	EQUIP LIST1
List of Instruments Due for Calibration	T2EQR1	EQUIP DUE	EQUIP DUE
Inquire on Collection Instrument	Inquire option from Kernel	N/A	EQUIP LIST1



### 13.6.3 Globals Referenced

The following files are read in this option:

<u>File Name</u>	<u>Subfile Name</u>	<u>File Number</u>	<u>Global Reference</u>	<u>Module Owner</u>	<u>Read or Update</u>
Collection Instrument	—	1086	↑EXP(1086,	EE	Read
Collection Instrument	—	1094	↑EXP(1094,	EE	Read
Type					
Calibration Agency	—	1095	↑EXP(1095,	EE	Read
Equipment Storage	—	1096	↑EXP(1096,	EE	Read
Location					

### 13.6.4 Variables

Only standard FileMan and Kernel variables are used.

## 14.0 SUPPORT FILES MAINTENANCE OPTIONS

### 14.1 Introduction to the Support Files Maintenance Options

The EE module uses several support files in its processing. These files fall into three groups: the Exposure Notices file, the Product file, and other reference files. The Exposure Notices file contains the standard text and template for each type of exposure notice produced. It supports the printing of notices in the Print Exposure Notices option (see Section 7.6). The Product file contains the identity of material products used in the workplace and a list of related stressor components. It is used during the entry of walkthrough data to create an automatic list of stressors for each workplace (see Section 5.2). The other reference files (Personal Protective Equipment, Respirators, Frequency of Operations, Laboratories, and Collection Instruments Type) are used to standardize the entry of values for these elements where they occur in the EE data base. The options by which these files are maintained are discussed in the remainder of this section.

### 14.2 Create Exposure Notice Form Letter Option

#### 14.2.1 Purpose

The Create Exposure Notice Form Letter option creates a form letter template entry which can be used to produce exposure notices by the EE module. Each form letter contains text as well as areas into which data from the Over MSAL file is to be inserted at the time of printing.

#### 14.2.2 Overview

The routine T2ENA creates or modifies an entry in the Exposure Notices file. DIC is used to lookup and/or add the selected entry. T2GED is then used to control the entry of the data. Figure 14-1 shows the routine structure diagram of this option.

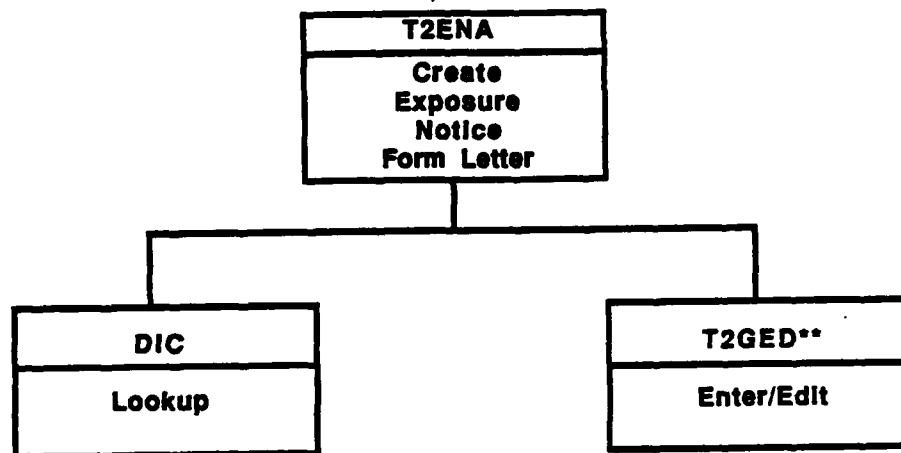
#### 14.2.3 Globals Referenced

The following file is updated in this option:

<u>File Name</u>	<u>Subfile Name</u>	<u>File Number</u>	<u>Global Reference</u>	<u>Module Owner</u>	<u>Read or Update</u>
Exposure Notices	---	1082	↑EXP(1082,	EE	Update

#### 14.2.4 Variables

Only standard FileMan and T2GED variables are used.



**FIGURE 14-1**  
**CREATE EXPOSURE NOTICE FORM LETTER OPTION**  
**ROUTINE STRUCTURE**

#### 14.2.5 Remarks

FileMan "windows" are used in the contents of the Text field of the Exposure Notices file entry to define the specific fields to be included from the Over MSAL file. Refer to the FileMan documentation for the details of this usage.

#### 14.3 Set Up Material Product File Option

##### 14.3.1 Purpose

The Set Up Material Product File option is used to create or modify an entry in the Product file. This file is used to generate a stressor list based on the products identified in a walkthrough survey. To provide logical linkage within OSHRKS, a file entry may be linked to one or more Hazardous Materials Information System (HMIS) records in the Materials file (a file owned by the Hazardous Materials Control (HMC) module).

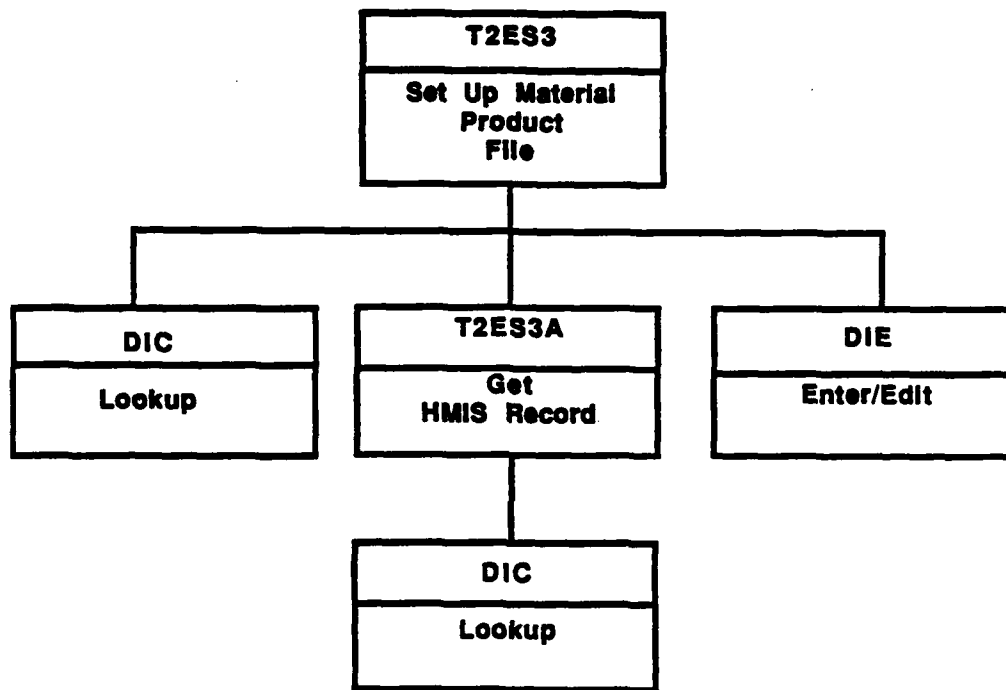
##### 14.3.2 Overview

The routine T2ES3 is invoked for this option. DIC is used to look up and/or add the entry to the Product file. T2GED is used to prompt the user for the Trade Name, Synonym, and Stressors fields. Then T2ES3A is invoked to get the Materials file entry for linkage. Upon return from T2ES3A, if a Materials entry was selected, the routine uses DIC to create the HMIS Alias subfile entry for the selected material. Figure 14-2 shows the routine structure diagram for the option.

T2ES3A offers the user a choice of fields upon which to look up in the Materials file and link to the Product file. After the user selects the "search criteria", DIC is invoked at entry point IX to confine the lookup to the specified cross reference of the Materials file. If a Materials file entry is selected, various fields of the entry are displayed to the user and he is asked to confirm his selection. If the selection is confirmed, the EHMIS variable is set to contain the pointer value of the selected entry. If no selection is made or if the selection is not confirmed, the routine returns a null value for the EHMIS variable. The routine structure is shown in Figure 14-2.

##### 14.3.3 Globals Referenced

<u>File Name</u>	<u>Subfile Name</u>	<u>File Number</u>	<u>Global Reference</u>	<u>Module Owner</u>	<u>Read or Update</u>
Product	---	1142	↑EMAT(0,	EE	Update
Materials	---	1080	↑HMAT(0,	HMC	Read
Ingredients	---	1077	↑HMC(1077,	HMC	Read



**FIGURE 14-2**  
**SET UP MATERIAL PRODUCT FILE OPTION**  
**ROUTINE STRUCTURE**

#### 14.3.4 Variables

The following variables are used:

- EDA: Internal number (DA) of the Product file entry
- EHMIS: Pointer value for the selected Materials file entry to be linked to the Product file entry

The following variables are used in the paragraph ENTSYN in the routine T2ES3:

- SA: Product file entry number in the KWIC cross reference on Synonym
- SB: Synonym subfile subscript in the KWIC cross reference on Synonym
- SC: The value of the name found in the DIC process, created either by concatenating the value of X (the entered value) with DS(DD) (the remainder of the name when more than one match was found) or by using the value of DIX (when only one match was found)
- SD: Trade Name of the entry being displayed

#### 14.3.5 Remarks

The routines T2HD1 and T2HD are used in the DIC("W") string to display additional information to the user upon lookup in the Materials file. See the documentation of these routines in the HMC Program Maintenance Manual.

The ENTSYN paragraph of T2ES3 is used within DIC("W") on lookups into the Product file. This paragraph enhances the displayed candidate list for each match on the KWIC cross reference of synonym filled.

#### 14.4 List Material Product File Option

##### 14.4.1 Purpose

The List Material Product File option produces a report of selected Products file entries, showing the Trade Name, Synonyms, and Stressors on file for each entry. If the entry is linked to one or more Materials file entries, data from each of the Materials file entries is shown on the report as well. This capability has been programmed but does not appear on the current EE menus.

#### 14.4.2 Overview

The routine T2ESR18 is invoked to produce a list of the Product file. The routine uses the print template MAT LIST when invoking DIP to perform the printing.

#### 14.4.3 Globals Referenced

<u>File Name</u>	<u>Subfile Name</u>	<u>File Number</u>	<u>Global Reference</u>	<u>Module Owner</u>	<u>Read or Update</u>
Product	---	1142	↑EMAT(0,	EE	Read
Materials	---	1080	↑HMAT(0,	HMC	Read
Stressor	---	1083	↑STRESS(0,	ADMIN	Read

#### 14.4.4 Variables

Only standard FileMan variables are used.

#### 14.4.5 Remarks

This option does not appear among the menu options listed in Table 3-1 because the developer of the module was requested to leave it off.

#### 14.5 List Reference Files Options

##### 14.5.1 Purpose

The List Reference Files options produce lists of the contents of a controlled vocabulary files. The files that can be printed with these options are: Personal Protective Equipment, Respirators, Frequency of Ops, Laboratories, and Collection Instrument Type. These routines have been written, but they are not currently used in options from the menus.

##### 14.5.2 Overview

The reference files lists are produced by routines that call the FileMan print routine DIP with the variables defined specifying the sort fields and print fields. In each case, the print capability is in the same routine as the enter/edit function for the file. The print function always starts at the entry point PR in the routine. Table 14-1 shows the routine and print template (where applicable) for each of the report options.

TABLE 14-1  
REFERENCE FILES LISTS, ROUTINES, AND TEMPLATES

REPORT NAME	ROUTINE	PRINT TEMPLATE
Personal Protective Equipment List	T2ETPPE	N/A
Respirators List	T2ETRSP	N/A
Frequency of Operations List	T2ETFRE	N/A
Laboratories List	T2ETL	LABORATORIES
Collection Instrument Type List	T2ETINS	N/A



#### 14.5.3 Globals Referenced

The following files are read in this option:

<u>File Name</u>	<u>Subfile Name</u>	<u>File Number</u>	<u>Global Reference</u>	<u>Module Owner</u>	<u>Read or Update</u>
Personal Protective Equipment	---	1103	↑EXP(1103,	EE	Read
Respirators	---	1105	↑EXP(1105,	EE	Read
Frequency of Ops	---	1106	↑EXP(1106,	EE	Read
Laboratories (Outside)	---	1131	↑EXP(1131,	EE	Read
Collection Instrument Type	---	1094	↑EXP(1094,	EE	Read

#### 14.5.4 Variables

Only standard FileMan variables are used.

#### 14.5.5 Remarks

This option does not appear among the menu options listed in Table 3-1 because the developer of the module was requested to leave it off.

## 15.0 SYSTEM MANAGER OPTIONS

### 15.1 Introduction to the System Manager Options

Certain options that relate specifically to the EE module are contained in a menu within the System Manager's menu options. These options allow the user to maintain the reference files used by the EE module and to maintain all of the files related to the Stressor file. These options are described in this section.

### 15.2 Enter/Edit Reference Files Options

#### 15.2.1 Purpose

The Enter/Edit Reference Files options are used to enter or edit the contents of a controlled vocabulary file. The files that can be updated with these options are: Personal Protective Equipment, Respirators, Frequency of Ops, Laboratories, and Collection Instrument Type.

#### 15.2.2 Overview

The Enter/Edit options for the Reference Files perform routines that call DIC and T2GED with the required variables defined. No input templates are used for these options because, in general, the number of fields to be entered is very small. Table 15-1 shows each file and the routine in which the file is maintained.

#### 15.2.3 Globals Referenced

The following files are updated in this option:

<u>File Name</u>	<u>Subfile Name</u>	<u>File Number</u>	<u>Global Reference</u>	<u>Module Owner</u>	<u>Read or Update</u>
Personal Protective Equipment	---	1103	↑EXP(1103,	EE	Update
Respirators	---	1105	↑EXP(1105,	EE	Update
Frequency of Ops	---	1106	↑EXP(1106,	EE	Update
Laboratories (Outside)	---	1131	↑EXP(1131,	EE	Update
Collection Instrument Type	---	1094	↑EXP(1094,	EE	Update

#### 15.2.4 Variables

Only standard T2GED variables are used.

TABLE 15-1  
REFERENCE FILE ENTER/EDIT ROUTINES

FILE NAME	ROUTINE
Personal Protective Equipment Respirators Frequency of Ops Laboratories Collection Instrument Type	T2ETPPE T2ETRSP T2ETFRE T2ETL T2ETINS

15.2.5 Remarks

The options to set up the Personal Protective Equipment and Frequency of Ops files have been deleted from the menus at the request of the Navy.

## 16.0 SPECIAL FUNCTIONS

### 16.1 Introduction to the Special Functions

The EE module makes use of FileMan features such as input syntax checking, trigger cross references, and computed fields to incorporate specialized features into the module. Because these features are invoked directly from the fields in the data dictionary, they can occur in more than one option of the module. This section documents features of this type that are used in more than one option of the EE module.

### 16.2 Calculation of Time in Boundary

#### 16.2.1 Purpose

There is a need to determine the time that an employee spends in boundaries because regulations dictate a maximum number of days per quarter and per year that an employee may be exposed to a given stressor. In producing reports of the access log data stored in the Boundary file, the EE module calculates the time spent in boundary.

#### 16.2.2 Overview

There are five (5) computed fields in the Boundary file that are related to the calculation of time in boundary for an employee. The several fields occur at different levels (within different subfiles) in the Boundary file. At the lowest level is the field Minutes in Boundary, which occurs in the Time In subfile. This field calculates the number of minutes per entry into the boundary from the difference between the Date/Time Out and the Date/Time In. (Date/Time In and Date/Time Out fields are stored in this subfile to permit an accurate calculation since a calculation on time requires knowledge of the dates involved.) At the Access Log Number level of the file, the values of each Minutes in Boundary from the Time In subfile are summed into a field called Total Minutes. This field is the total number of minutes spent in a boundary for a given shift. At the Employee level of the file, Employee Minutes is a sum of the Total Minutes field at the previous lower level of the file. This field expresses, in minutes, the total time an employee has spent in this specific boundary. For an expression of the time spent in boundary in hours, the field Employee Hours calculates the number of minutes and divides by sixty (60). Note that Employee Minutes shows the amount of time an employee has spent in a specific boundary in hours and decimal parts of hours (two decimal places).

The Employee Days calculation differs from the previously discussed fields in that it does not attempt to use the access log time in and time out data to determine the amount of time an employee has spent in a boundary. The calculation used for this field counts each shift in which the employee enters the boundary as a day. The field is calculated by counting the number of access logs that have been entered for the employee.

Because the Boundary file is organized primarily by boundary, each of these computed fields in the file calculates the value for a specific boundary. The boundary reports may sum these fields across boundaries as necessary.

#### 16.2.3 Globals Referenced

The following file contains the fields referenced above:

<u>File Name</u>	<u>Subfile Name</u>	<u>File Number</u>	<u>Global Reference</u>	<u>Module Owner</u>	<u>Read or Update</u>
Boundary	—	1071	↑EBOUND(	EE	Read

#### 16.2.4 Variables

Because the above calculations are expressed with FileMan functions and fields of the data dictionary, there are no variables involved.

#### 16.2.5 Remarks

These calculations use the COUNT and TOTAL functions of FileMan to express the fields involved and the arithmetic conversions to be performed.

### 16.3 Evaluation of Sample Results Against Current Stressor Limits

#### 16.3.1 Purpose

The computed fields that evaluate sample results against the current stressor limits enable the IH to determine the impact of changes to the regulations or guidelines dictating limits to exposure.

#### 16.3.2 Overview

In the Sample Survey file are several computed fields that relate to the current stressor limits. These fields are available to support ad hoc query from the Sample Survey file and are not used in the normal processing of the EE module. Each of the fields involved is computed in the T2ESACUN routine at a unique entry point. The fields computed are the following:

- Navy Limit Now
- PEL Limit Now
- TLV Limit Now
- Other Limit Now
- MSAL Now
- Other Limit Auth Now
- Over MSAL Now
- Over Navy Limit Now
- Over PEL Now
- Over TLV Now
- Over Other Limit Now

The fields can be grouped into three (3) classes: fields that contain the current limit value, fields that tell if the current limit is exceeded, and the name of the Other Limit Authority. The routine T2ESACUN creates the values for each of these fields. Paragraphs NAV, PEL, TLV, MSAL, and OTHER get the appropriate limit from the Stressor file, based on the Stressor, Units, and Result Type fields in the Stressors subfile of the Sample Survey file. Paragraphs OMSAL, ONAV, OPEL, OTLV, OOTH use the current stressor limit value to determine if the Result exceeds the limit. This calculation is similar to that used for the "at entry" evaluation fields: "N/A" indicates that no limit is present, 0 indicates that the result is less than the limit, 1 indicates that the result is greater than or equal to the limit value. Assuming that these fields will most often be used as a group, the T2ESACUN routine uses the local array ELIM to store values from the Stressor file. This keeps the routine from having to reread the Stressor file entry when processing each of these computed fields for a specific result; it also makes it possible to use the ELIM values previously retrieved if the stressor does not differ from one result to another. Since it is anticipated that these fields will be used to report from the Sample Survey file for one stressor at a time, this should greatly reduce the processing involved in using the computed fields.

### 16.3.3 Globals Referenced

The following files are involved in this calculation:

<u>File Name</u>	<u>Subfile Name</u>	<u>File Number</u>	<u>Global Reference</u>	<u>Module Owner</u>	<u>Read or Update</u>
Sample Survey	Stressors	1124.08	↑ESAMP(	EE	Read
Stressor	Units	1083	↑STRESS(0,	ADMIN	Read

### 16.3.4 Variables

The following variables are used:

- ELIM array: Subscripted by Stressor pointer value, Sample Units pointer value. Contains the Units subfile string from Stressor file.
- ERES: Result value.
- ESTR: Sample Survey file Stressors subfile entry, later set to Stressor pointer value.
- ESTY: Internal value for Result Type.
- EUN: Subscript of the node in the Units subfile of the Stressor file.
- EUNIT: Sample Units pointer of the result.
- EX: Flag to control flow in the paragraphs that get the limit value from the ELIM array; distinguishes between checking the limit value (when it is defined) and getting the limit value (when it is undefined).

### 16.3.5 Remarks

The paragraph OOVER is already programmed, though not used. It determines whether the Result value is an overexposure according to the current limits of the Stressor file. At present there is no computed field in the Sample Survey file which uses this capability. This calculation uses the following hierarchy for limits:

- If there is a "Navy" limit—evaluate result against "Navy" limit
- Else, if there is a "PEL" limit—evaluate result against "PEL" limit



- Else, if there is a "TLV" limit--evaluate result against "TLV" limit
- Else, if there is an "Other" limit--evaluate result against "Other" limit

APPENDIX A  
OPTIONS LIST WITH ROUTINES

MENU OPTION

Access Log by Boundary  
Access Log by Employee  
Access Log by Stressor  
Annotate Over MSAL Record  
Boundary Status Report  
Close Boundary  
Compile New Over MSALs  
Create Exposure Notice Form Letter  
Detailed Bulk/Wipe Samples Reports  
Detailed Samples Report Functions  
Employee Samples Reports  
Enter Access Log  
Enter Sampling Goals  
Enter/Edit Collection Instrument  
Enter/Edit Sample Survey  
Exposure Risk Report  
Inactivate an Existing Instrument  
Inquire for Survey  
List Equipment Inventory  
List Locations by Stressor  
List of Instruments Due for Calibration  
Material Inventory Entry  
Material Inventory Report (By Location)  
Material Inventory Report (By Survey Number)  
Material Location List  
Open Boundary  
Outstanding Samples Report  
Overdue Samples Report  
Overdue Survey Actions Report  
Overexposure Notice Print  
Overexposure/Over MSAL Report by Operation  
Overexposure/Over MSAL Report by Location  
Prepare Overexposure Notices  
Print Exposure Notices by Employee  
Print Over MSAL List  
Receive Samples  
Record/Edit Calibration for Returned Instrument  
Reopen Closed Boundary  
Sample Summary Report by Monitor  
Sample Summary Report by Stressor  
Sampling Progress Report  
Send Out Instrument for Calibration  
Send Out Samples

ROUTINE

T2EBR6  
T2EBR5  
T2EBR4  
T2ENB1  
T2EBR7  
T2EBCL  
T2ESOMC  
T2ENA  
T2ESR19  
T2ESR17  
T2ESR16  
T2EBACC  
T2ESGEN  
T2EQEN  
T2ESAB  
T2ESR4  
T2EQD  
T2ES1  
T2EQR2  
T2ESR21  
T2EQR1  
T2EMI  
T2EMR2  
T2EMR1  
T2EMR3  
T2EBOP  
ALL↑T2EL3  
T2EL3  
T2EACR2  
T2ENC  
T2ESR15  
T2ESR15A  
T2ENB  
EN2↑T2ENC  
T2ESR14  
T2EL2  
T2EQ2  
OPEN↑T2EBCL  
T2ESR10  
T2ESR11  
T2ESR6  
T2EQ1  
T2EL1

MENU OPTION

Set Up Collection Instrument Type  
Set Up Frequency of Operations File  
Set Up Laboratory File  
Set Up Material Product File  
Set Up PPE File  
Set Up Respiratory Protection File  
Summary Report of Samples  
Survey Action Completion  
Survey Action Entry  
Survey Action Report  
Survey Description List (By Survey Number)  
Ventilation Survey Entry  
Ventilation Survey Report Functions  
Walkthrough Data Entry  
Walkthrough Frequency Entry  
Walkthrough Results (By Survey Number)  
Walkthrough Summary Report (By Date)  
Walkthrough by Location/Operation  
Walkthrough by Operation/Location  
Walkthroughs Due Report  
Walkthroughs Overdue Report

ROUTINE

T2ETINS  
T2ETFRE  
ENT↑T2ETL  
T2ES3  
ENT↑T2ETPPE  
ENT↑T2ETRSP  
T2ESR5  
CLOS↑T2EACT  
T2EACT  
T2EACR1  
T2ESR1  
T2EV1  
T2EVR3  
T2ESURV  
T2ESMON  
T2ESR20  
T2ESR3  
T2ESR2  
T2ESR9  
DUE↑T2ESMR1  
OVER↑T2ESMR1

APPENDIX B  
PRINT TEMPLATES

PRINT TEMPLATE

ACCESS LIST

ACCESS LIST1

ACCESS LIST2

BND STATUS

EQUIP DUE

EQUIP LIST1

GOALS LIST1

LABORATORIES

LOC/OP DETAIL

LOCS BY STRESSOR

MAT INV

MAT LIST

MAT LOC2

MON PLAN LIST

MONTH SAM

OP/LOC DETAIL

OVER MSAL

OVERDUE

RISK BY LOC

RISK BY OP2

OPTION

Access Log for Employee

Access Log by Boundary

Access Log by Stressor

Boundary Status Report

List of Instruments Due for  
Calibration

Inquire on Collection Instrument  
List Equipment Inventory

Sampling Progress Report

Laboratories List

Walkthrough by Location/Operation

List Locations by Stressor

Material Inventory Report  
(by Location)  
Material Inventory Report  
(by Survey Number)

List Material Product File

Material Location List

Walkthroughs Due Report  
Walkthroughs Overdue Report

Sample Summary Report by Monitor

Walkthrough by Operation/Location

Print Over MSAL List

Overdue Samples Report  
Outstanding Samples Report

Exposure Risk Report

Exposure Risk Report

PRINT TEMPLATE

SAMPLE SUM

STR STD MONTHLY REPORT

SURVEY ACTION

VENT SURVEY

WALK DETAIL

WALK SUM

OPTION

Summary Report of Samples

Sample Summary Report by Stressor

Overdue Survey Actions Report  
Survey Action Report

Ventilation Survey Report Functions

Inquire for Survey  
Walkthrough Results  
(By Survey Number)

Survey Description List  
(By Survey Number)  
Walkthrough Summary (By Date)

APPENDIX C  
SORT TEMPLATES



SORT TEMPLATE

ACCESS BY EMP

ACCESS BY STR/EMP/#/DATE

BND STATUS

BY ACT/DATE/SYS/SRC

BY ACT/LOC/INVEST/DATE

BY DATE/STR/LOC

BY STRESSOR

BY STR/LOC/OP/DATE

EQUIP DUE

EQUIP LIST 1

EXPOSURE LETTERS

GOALS BY LOC/OP/STR

MAT INV

MAT INV-LOC

MAT LOC2

MONITOR

MON PLAN LIST2

OUTSTANDING

OVERDUE

OVERDUE ACTION

OPTION

Access Log for Employee

Access Log by Boundary  
Access Log by Stressor

Boundary Status Report

Ventilation Survey Report Functions

Ventilation Survey Report Functions

Sample Summary Report by Stressor

List Locations By Stressor

Summary Report of Samples

List of Instruments Due for  
Calibration

List Equipment Inventory

Print Exposure Notices

Sampling Progress Report

Material Inventory Report  
(by Survey Number)

Material Inventory Report  
(by Location)

Material Location List

Sample Summary Report by Monitor

Walkthroughs Due Report  
Walkthroughs Overdue Report

Outstanding Samples Report

Overdue Samples Report

Overdue Survey Actions Report

SORT TEMPLATE

OVER MSAL

SPECMONITOR

SURVEY ACTION

VENT SURVEY

WALK BY DATE

WALK BY LOC/OP

WALK BY OP/LOC

WALK BY NUMBER

W BY LOC/OP/DT

W BY OP/LOC/DT

OPTION

Print Over MSAL List

Sample Summary Report by Monitor

Survey Action Report

Ventilation Survey Report Functions

Walkthrough Summary (by Date)

Walkthrough by Location/Operation

Walkthrough by Operation/Location

Walkthrough Results (By Survey Number)

Exposure Risk Report

Exposure Risk Report